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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1140 (33259)

Analyses Performed By:

Vista Analytical Laboratory
El Dorado Hills, California

Report: #14576R VAL
Project: B0009966.0002.70006

SUMMARY

This data quality validation report summarizes the review of Sample Delivery Group (SDG) #PRR1140 (33259) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOP V-7 "Verification Validation PCDD/PCDFs", Revision 0, January 2009, and EPA Region 2 SOP HW-25, Rev. 3 "Validating Tetra- through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS) Method 1613.

This report contains the results of the data verification and validation including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCDD/ PCDF	MET	MISC
PRR1SOLSP-01	33259-001	Soil	7/8/2011				X		

PCDD/PCDFs – USEPA 1613

SUMMARY OF FINDINGS

Major

None.

Minor

None.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

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 relative standard deviation (RSD) of 20% is allowed for all non-labeled compounds (target) and 30% is allowed for all labeled compounds (internal standards and recovery standards)

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibited percent difference (%D) less than the control limit (20%).

All calibration criteria were within the control limits.

5. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

6. INTERNAL STANDARD PERFORMANCE

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds exhibit recoveries within the control limits of 40% to 135%.

All internal standard areas and retention times were within established limits.

7. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

8. SECOND COLUMN CONFIRMATION

Target compounds were not detected in the sample; therefore, confirmation analysis was not required.

9. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS and MSD analysis was performed on sample PRR1SOLSP-01 for PCDD/PCDF analysis. Upon evaluation, precision and accuracy indicators were favorable in all cases.

10. Reporting

This SDG does not contain re-extraction, re-analysis or dilution.

11. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

12. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

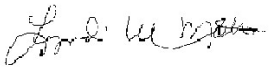
Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

13. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: August 24, 2011

PEER REVIEW BY: Dennis Capria

DATE: September 6, 2011

VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - Dioxin

ANALYTE		PRR1SOLSP-01	LQ	VQ
1,2,3,4,6,7,8-HpCDD	pg/g	0.332	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.11	U	U
1,2,3,4,7,8,9-HpCDF	pg/g	0.146	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.166	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.0895	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.175	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.0916	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.185	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.158	U	U
1,2,3,7,8-PeCDD	pg/g	0.115	U	U
1,2,3,7,8-PeCDF	pg/g	0.103	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.107	U	U
2,3,4,7,8-PeCDF	pg/g	0.116	U	U
2,3,7,8-TCDD	pg/g	0.149	U	U
2,3,7,8-TCDF	pg/g	0.0977	U	U
OCDD	pg/g	0.646	U	U
OCDF	pg/g	0.407	U	U
Total HpCDD	pg/g	0.332	U	U
Total HpCDF	pg/g	0.126	U	U
Total HxCDD	pg/g	0.175	U	U
Total HxCDF	pg/g	0.108	U	U
Total PeCDD	pg/g	0.115	U	U
Total PeCDF	pg/g	0.109	U	U
Total TCDD	pg/g	0.149	U	U
Total TCDF	pg/g	0.0979	U	U

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLSP-01 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33259-001	Date Received:	9-Jul-11
Project:	PRR1140	Sample Size:	10.2 g	QC Batch No.:	3877	Date Extracted:	12-Jul-11
Date Collected:	8-Jul-11	%Solids:	98.0	Date Analyzed DB-5:	14-Jul-11	Date Analyzed DB-225:	NA
Time Collected:	1100						

Analyte	Conc. (pg/g)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	ND	0.149		
1,2,3,7,8-PeCDD	ND	0.115		
1,2,3,4,7,8-HxCDD	ND	0.166		
1,2,3,6,7,8-HxCDD	ND	0.175		
1,2,3,7,8,9-HxCDD	ND	0.185		
1,2,3,4,6,7,8-HpCDD	ND	0.332		
OCDD	ND	0.646		
2,3,7,8-TCDF	ND	0.0977		
1,2,3,7,8-PeCDF	ND	0.103		
2,3,4,7,8-PeCDF	ND	0.116		
1,2,3,4,7,8-HxCDF	ND	0.0895		
1,2,3,6,7,8-HxCDF	ND	0.0916		
2,3,4,6,7,8-HxCDF	ND	0.107		
1,2,3,7,8,9-HxCDF	ND	0.158		
1,2,3,4,6,7,8-HpCDF	ND	0.110		
1,2,3,4,7,8,9-HpCDF	ND	0.146		
OCDF	ND	0.407		

Totals		
Total TCDD	ND	0.149
Total PeCDD	ND	0.115
Total HxCDD	ND	0.175
Total HpCDD	ND	0.332
Total TCDF	ND	0.0979
Total PeCDF	ND	0.109
Total HxCDF	ND	0.108
Total HpCDF	ND	0.126

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	93.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	88.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	95.4	23 - 140	
	13C-OCDD	102	17 - 157	
	13C-2,3,7,8-TCDF	68.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	91.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	86.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	89.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	89.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	87.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	93.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	96.3	26 - 138	
	13C-OCDF	101	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	99.1	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Martha M. Maier 20-Jul-2011 12:49

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #: 33259

33259, 0.6°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Removal Action Work Plan Quality Assurance Project Plan	PRR1140	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1SOLSP-01	7/8/2011	11:00	Soil	Composite	2	X																				

Requested Analyses
1 PCDDs/PCDFs
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking # 794954127614

Specify Turnaround Requirements: 14-day

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 0.6°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	7/8/2011	1830	FED EX	FEDEX	7/9/11	0932	
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1141 (33287)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #14577R VAL
Project: B0009966.0002.70006

SUMMARY

This data quality validation report summarizes the review of Sample Delivery Group (SDG) #PRR1141 (33287) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOP V-7 "Verification Validation PCDD/PCDFs", Revision 0, January 2009, and EPA Region 2 SOP HW-25, Rev. 3 "Validating Tetra- through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS) Method 1613.

This report contains the results of the data verification and validation including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCDD/ PCDF	MET	MISC
PRR1SOLIF-01	33287-001	Soil	7/22/2011				X		
PRR1SOLIF-02	33287-002	Soil	7/22/2011				X		

PCDD/PCDFs – USEPA 1613

SUMMARY OF FINDINGS

Major

None.

Minor

None.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

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 relative standard deviation (RSD) of 20% is allowed for all non-labeled compounds (target) and 30% is allowed for all labeled compounds (internal standards and recovery standards)

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibited percent difference (%D) less than the control limit (20%).

All calibration criteria were within the control limits.

5. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

6. INTERNAL STANDARD PERFORMANCE

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds exhibit recoveries within the control limits of 40% to 135%.

All internal standard areas and retention times were within established limits.

7. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

8. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDD and 2,3,7,8-TCDF were not detected; therefore, confirmation analysis was not required.

9. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

An MS and MSD were performed on sample PRR1SOLIF-01 for PCDD/PCDF analysis. Upon evaluation, precision and accuracy indicators were favorable in all cases.

10. Reporting

This SDG does not contain re-extraction, re-analysis or dilution.

11. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

12. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

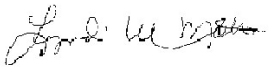
Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

13. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: August 24, 2011

PEER REVIEW BY: Dennis Capria

DATE: September 6, 2011

VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - Dioxin

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
1,2,3,4,6,7,8-HpCDD	pg/g	0.346	U,EMPC	U,EMPC	0.254	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.103	U	U	0.112	U	U
1,2,3,4,7,8,9-HpCDF	pg/g	0.105	U	U	0.141	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.132	U	U	0.14	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.0474	U	U	0.0792	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.142	U	U	0.144	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.0516	U	U	0.0971	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.127	U	U	0.142	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.0756	U	U	0.128	U	U
1,2,3,7,8-PeCDD	pg/g	0.0828	U	U	0.0905	U	U
1,2,3,7,8-PeCDF	pg/g	0.0785	U	U	0.0471	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.0601	U	U	0.0965	U	U
2,3,4,7,8-PeCDF	pg/g	0.0889	U	U	0.0978	U	U
2,3,7,8-TCDD	pg/g	0.0922	U	U	0.115	U	U
2,3,7,8-TCDF	pg/g	0.05	U	U	0.0526	U	U
OCDD	pg/g	43.4			0.6	J	J
OCDF	pg/g	0.145	U	U	0.281	U	U
Total HpCDD	pg/g	0.351			0.156	U	U
Total HpCDF	pg/g	0.104	U	U	0.102	U	U
Total HxCDD	pg/g	0.134	U	U	0.142	U	U
Total HxCDF	pg/g	0.0579	U	U	0.0991	U	U
Total PeCDD	pg/g	0.0432	U,EMPC	U,EMPC	0.105	U	U
Total PeCDF	pg/g	0.0541	U	U	0.0832	U	U
Total TCDD	pg/g	0.0921	U	U	0.0906	U	U
Total TCDF	pg/g	0.05	U	U	0.0497	U	U

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLIF-01 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33287-001	Date Received:	23-Jul-11
Project:	PRR1141	Sample Size:	10.4 g	QC Batch No.:	3909	Date Extracted:	24-Jul-11
Date Collected:	22-Jul-11	%Solids:	97.1	Date Analyzed DB-5:	25-Jul-11	Date Analyzed DB-225:	NA
Time Collected:	1100						

Analyte	Conc. (pg/g)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	ND	0.0922		
1,2,3,7,8-PeCDD	ND	0.0828		
1,2,3,4,7,8-HxCDD	ND	0.132		
1,2,3,6,7,8-HxCDD	ND	0.142		
1,2,3,7,8,9-HxCDD	ND	0.127		
1,2,3,4,6,7,8-HpCDD	ND		0.346	
OCDD	43.4			
2,3,7,8-TCDF	ND	0.0500		
1,2,3,7,8-PeCDF	ND	0.0785		
2,3,4,7,8-PeCDF	ND	0.0889		
1,2,3,4,7,8-HxCDF	ND	0.0474		
1,2,3,6,7,8-HxCDF	ND	0.0516		
2,3,4,6,7,8-HxCDF	ND	0.0601		
1,2,3,7,8,9-HxCDF	ND	0.0756		
1,2,3,4,6,7,8-HpCDF	ND	0.103		
1,2,3,4,7,8,9-HpCDF	ND	0.105		
OCDF	ND	0.145		

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	93.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	95.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	96.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	95.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	97.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	96.3	23 - 140	
	13C-OCDD	93.0	17 - 157	
	13C-2,3,7,8-TCDF	97.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	114	24 - 185	
	13C-2,3,4,7,8-PeCDF	108	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	90.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	88.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	92.1	26 - 138	
	13C-OCDF	89.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	114	35 - 197	

Totals				
Total TCDD	ND	0.0921		
Total PeCDD	ND		0.0432	
Total HxCDD	ND	0.134		
Total HpCDD	0.351		0.697	
Total TCDF	ND	0.0500		
Total PeCDF	ND	0.0541		
Total HxCDF	ND	0.0579		
Total HpCDF	ND	0.104		

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.0130

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: FEB

Approved By: Calvin Tanaka 27-Jul-2011 15:40

Sample ID: **PRR1SOLIF-02** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33287-002	Date Received:	23-Jul-11
Project:	PRR1141	Sample Size:	10.1 g	QC Batch No.:	3909	Date Extracted:	24-Jul-11
Date Collected:	22-Jul-11	%Solids:	99.4	Date Analyzed DB-5:	25-Jul-11	Date Analyzed DB-225:	NA
Time Collected:	1115						

Analyte	Conc. (pg/g)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	ND	0.115		
1,2,3,7,8-PeCDD	ND	0.0905		
1,2,3,4,7,8-HxCDD	ND	0.140		
1,2,3,6,7,8-HxCDD	ND	0.144		
1,2,3,7,8,9-HxCDD	ND	0.142		
1,2,3,4,6,7,8-HpCDD	ND	0.254		
OCDD	0.600			J
2,3,7,8-TCDF	ND	0.0526		
1,2,3,7,8-PeCDF	ND	0.0471		
2,3,4,7,8-PeCDF	ND	0.0978		
1,2,3,4,7,8-HxCDF	ND	0.0792		
1,2,3,6,7,8-HxCDF	ND	0.0971		
2,3,4,6,7,8-HxCDF	ND	0.0965		
1,2,3,7,8,9-HxCDF	ND	0.128		
1,2,3,4,6,7,8-HpCDF	ND	0.112		
1,2,3,4,7,8,9-HpCDF	ND	0.141		
OCDF	ND	0.281		

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	84.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	103	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	95.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	95.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	98.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	103	23 - 140	
	13C-OCDD	102	17 - 157	
	13C-2,3,7,8-TCDF	97.4	24 - 169	
	13C-1,2,3,7,8-PeCDF	120	24 - 185	
	13C-2,3,4,7,8-PeCDF	114	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	93.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	96.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	96.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	94.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	102	26 - 138	
	13C-OCDF	97.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	102	35 - 197	

Totals		
Total TCDD	ND	0.0906
Total PeCDD	ND	0.105
Total HxCDD	ND	0.142
Total HpCDD	ND	0.156
Total TCDF	ND	0.0497
Total PeCDF	ND	0.0832
Total HxCDF	ND	0.0991
Total HpCDF	ND	0.102

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0.000180**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 27-Jul-2011 15:40

33287, 1.8°C

Lab WorkOrder #

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Removal Action Work Plan Quality Assurance Project Plan	PRR1141	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1SOLIF-01	7/22/2011	11:00	Soil	Composite	2	X																				MS/MSD
PRR1SOLIF-02	7/22/2011	11:15	Soil	Composite	2	X																				

Requested Analyses

1 PCDD/PCDF
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Special Instructions/Comments:

5-day turnaround

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking # 795000260618

Specify Turnaround Requirements: 5-day

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	7/22/2011	1800		07/23/11 1015			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1141A (33307)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #14578R VAL
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1141A (33307) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOP V-7 "Verification Validation PCDD/PCDFs", Revision 0, January 2009, and EPA Region 2 SOP HW-25, Rev. 3 "Validating Tetra- through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS) Method 1613.

This report contains the results of the data verification and validation including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCDD/ PCDF	MET	MISC
PRR1SOLIF-03	33307-001	Water	7/22/2011				X		

PCDD/PCDFs – USEPA 1613

SUMMARY OF FINDINGS

Major

None.

Minor

None.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

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 relative standard deviation (RSD) of 20% is allowed for all non-labeled compounds (target) and 30% is allowed for all labeled compounds (internal standards and recovery standards)

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibited percent difference (%D) less than the control limit (20%).

All calibration criteria were within the control limits.

5. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

6. INTERNAL STANDARD PERFORMANCE

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds exhibit recoveries within the control limits of 40% to 135%.

All internal standard areas and retention times were within established limits.

7. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

8. SECOND COLUMN CONFIRMATION

Target compounds were not detected in the sample; therefore, confirmation analysis was not required.

9. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

An MS was performed on sample PRR1SOLIF-03 for PCDD/PCDF analysis. Upon evaluation, accuracy indicators were favorable in all cases.

10. Reporting

This SDG does not contain re-extraction, re-analysis or dilution.

11. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

12. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

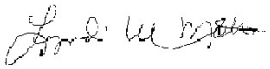
Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
G	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

13. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: August 24, 2011

PEER REVIEW BY: Dennis Capria

DATE: September 6, 2011

VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - Dioxin

ANALYTE		PRR1SOLIF-03	LQ	LQ
1,2,3,4,6,7,8-HpCDD	pg/L	0.346	U	U
1,2,3,4,6,7,8-HpCDF	pg/L	0.198	U	U
1,2,3,4,7,8,9-HpCDF	pg/L	0.241	U	U
1,2,3,4,7,8-HxCDD	pg/L	0.435	U	U
1,2,3,4,7,8-HxCDF	pg/L	0.183	U	U
1,2,3,6,7,8-HxCDD	pg/L	0.458	U	U
1,2,3,6,7,8-HxCDF	pg/L	0.102	U	U
1,2,3,7,8,9-HxCDD	pg/L	0.503	U	U
1,2,3,7,8,9-HxCDF	pg/L	0.173	U	U
1,2,3,7,8-PeCDD	pg/L	0.26	U	U
1,2,3,7,8-PeCDF	pg/L	0.159	U	U
2,3,4,6,7,8-HxCDF	pg/L	0.113	U	U
2,3,4,7,8-PeCDF	pg/L	0.148	U	U
2,3,7,8-TCDD	pg/L	0.182	U	U
2,3,7,8-TCDF	pg/L	0.163	U	U
OCDD	pg/L	0.457	U	U
OCDF	pg/L	0.345	U	U
Total HpCDD	pg/L	0.346	U	U
Total HpCDF	pg/L	0.22	U	U
Total HxCDD	pg/L	0.465	U	U
Total HxCDF	pg/L	0.12	U	U
Total PeCDD	pg/L	0.26	U	U
Total PeCDF	pg/L	0.154	U	U
Total TCDD	pg/L	0.182	U	U
Total TCDF	pg/L	0.163	U	U

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID:	PRR1SOLIF-03				EPA Method 1613
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33307-001
Project:	PRR1141	Sample Size:	0.979 L	QC Batch No.:	3932
Date Collected:	22-Jul-11			Date Analyzed DB-5:	6-Aug-11
Time Collected:	1130				
				Date Received:	4-Aug-11
				Date Extracted:	4-Aug-11
				Date Analyzed DB-225:	NA

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	ND	0.182		
1,2,3,7,8-PeCDD	ND	0.260		
1,2,3,4,7,8-HxCDD	ND	0.435		
1,2,3,6,7,8-HxCDD	ND	0.458		
1,2,3,7,8,9-HxCDD	ND	0.503		
1,2,3,4,6,7,8-HpCDD	ND	0.346		
OCDD	ND	0.457		
2,3,7,8-TCDF	ND	0.163		
1,2,3,7,8-PeCDF	ND	0.159		
2,3,4,7,8-PeCDF	ND	0.148		
1,2,3,4,7,8-HxCDF	ND	0.183		
1,2,3,6,7,8-HxCDF	ND	0.102		
2,3,4,6,7,8-HxCDF	ND	0.113		
1,2,3,7,8,9-HxCDF	ND	0.173		
1,2,3,4,6,7,8-HpCDF	ND	0.198		
1,2,3,4,7,8,9-HpCDF	ND	0.241		
OCDF	ND	0.345		

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	101	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	77.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	80.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	77.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	73.5	23 - 140	
	13C-OCDD	62.8	17 - 157	
	13C-2,3,7,8-TCDF	95.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	99.5	24 - 185	
	13C-2,3,4,7,8-PeCDF	102	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	87.6	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	85.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	83.0	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	80.6	26 - 138	
	13C-OCDF	70.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	108	35 - 197	

Totals		
Total TCDD	ND	0.182
Total PeCDD	ND	0.260
Total HxCDD	ND	0.465
Total HpCDD	ND	0.346
Total TCDF	ND	0.163
Total PeCDF	ND	0.154
Total HxCDF	ND	0.120
Total HpCDF	ND	0.220

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: ANP

Approved By: Martha M. Maier 07-Aug-2011 15:15

33307, 5.8°C

Intercompany Chain of Custody

SDG/Job Reference	**PRR1141 (200-6218)**
PO Reference	
Project ID	**Tierra Solutions / Arcadis**
Project Name	**LPRSA - Phase I Removal Action**
Due Date	

FROM: TestAmerica Laboratories, Inc.
30 Community Drive, Suite 11
South Burlington, VT 05403

Tel: 802 660-1990 Fax: 802 660-1919

TO: Sample Receiving
Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762

Tel: 916-673-1520

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Use "Client Sample ID" for log-in and reporting. Report results to Arcadis. Invoice Arcadis

	Client Sample ID	Lab Sample ID	Matrix	SDG	Date Sampled	Time Sampled	Date Received	Due Date	Number of Containers	Method Requested
1	PRR1SOLIF-03	200-6218-2	SPLP Extract	PRR1141	8/3/2011*	0845			2 (NP) Amber	PCDD/PCDF
2	PRR1SOLIF-03MS	200-6218-2MS	SPLP Extract	PRR1141	8/3/2011*	0845			2 (NP) Amber	PCDD/PCDF

* Date Sampled references the endpoint of the SPLP extract generation.

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
[signature]	08/03/11	1620	[signature]	8/4/11	0944
TestAmerica Laboratories (Burlington)			Vista Analytical Laboratory		

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1140 (200-5934)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #14587R VAL
Project: B0009966.0002.70006

SUMMARY

This data quality validation report summarizes the review of Sample Delivery Group (SDG) #PRR1140 (200-5934) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOPs; USEPA National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010); and EPA Region 2 Data Validation SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation and validation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1SOLSP-01	200-5934-01	Soil	7/8/2011		X	X	X	X	X
TB07082011-01	200-5934-02	Water	7/8/2011		X				

Miscellaneous parameters include Chlorinated Herbicides by SW846 8151A, pH by SW846 9045C and Particle Size by ASTM D422.
Volatiles, Semivolatiles, Pesticides, Aroclor PCBs by USEPA SOM0.1.2.
Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of acetophenone, di-n-butyl phthalate, butyl benzyl phthalate, and bis(2-ethylhexyl) phthalate. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

All analytes 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
PRR1SOLSP-01	Acetophenone Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl)phthalate	<PQL[1]	Detected sample results <PQL	UB at the PQL

PQL = 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 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 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 compounds associated with the calibrations were within the specified control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance 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)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLSP-01 for semivolatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

SEMIVOLATILE SIM DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of naphthalene, 2-methylnaphthalene, pyrene, and benzo(a)pyrene. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Benzo(a)pyrene was observed in the associated method blank above the project quantitation limits (PQL).

All analytes 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
PRR1SOLSP-01	Naphthalene 2-Methylnaphthalene Pyrene	<PQL	Detected sample results <PQL	UB at the PQL
	Benzo(a)pyrene	>PQL	Detected sample results >PQL and < blank concentration	UB at detected sample concentration

PQL = reporting limit is equal to the low point of the initial calibration curve.

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 compounds associated with the calibrations were within the specified control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance 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)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLSP-01 for semivolatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

VOLATILE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

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
PRR1SOLSP-01	1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene	<PQL[1]	Detected sample results <PQL	UB at the PQL

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

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 calibration criteria were within the control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance 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 areas and retention times were within established limits.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLSP-01 for volatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

PESTICIDE and 2,4-DDX SERIES DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC. This compound was detected in the sample at a concentration less than five times the method blank concentration; therefore, beta-BHC in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

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
PRR1SOLSP-01	beta-BHC	<PQL	Detected sample results <PQL	UB at the PQL

PQL Practical Quantitation 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

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLSP-01 for pesticide analysis. All recoveries were observed within acceptable limits.

7. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

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. 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 did not meet %D criteria for beta-BHC. The sample result was revised to non-detect due to method blank contamination. Therefore, no qualification is required for the dual column analysis.

11. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

12. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

13. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide analysis is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

14. Overall Assessment

Overall 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.

AROCLOR PCB DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

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

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLSP-01 for PCB analysis. All recoveries were observed within acceptable limits.

7. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

8. 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%.

Aroclor PCBs were not detected in the sample.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for Aroclor analysis is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

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 is allowed.

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

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

6. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLSP-01 for herbicide analysis. All recoveries were observed within acceptable limits.

8. 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 40%.

Herbicides were not detected in the samples.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for herbicide analysis is greater than 40 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

TOTAL METALS DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The matrix spike recoveries were less than the lower acceptance limit for three analytes, indicating potential low bias for positive and non-detect results for the affected analyte in the associated samples. Project accuracy measurement performance criteria were not met for the affected analytes.

Precision – The laboratory duplicate relative percent difference (RPD) were greater than the acceptance limit for four analytes, indicating matrix interferences. Project bias measurement performance criteria were not met for the affected analytes.

Matrix Interference – The serial dilution percent difference (%D) were greater than the acceptance limit for four analytes. Project accuracy measurement performance criteria were not met for the affected analytes.

Accuracy/Bias - The method blank exhibited low level concentration of thallium. This analyte was detected in the sample at a concentration less than five times the method blank concentration; therefore, thallium in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

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	Analyte	Blank Result	Sample Result	Qualification
PRR1SOLSP-01	Thallium	<PQL	Detected sample results <PQL	UB at the PQL

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 continuing calibration verification standard recoveries were within the control limit.

3.2 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

5. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

Sample PRR1SOLSP-01 was selected for MS analysis. The result of this evaluation was that all elements had observed spike recoveries within limits (75-125%) with the following exceptions. The observed recoveries for antimony, selenium and silver did not meet accuracy acceptance criteria, indicating potential

low bias in associated samples. Project accuracy/bias measurement performance criteria were not met for antimony, selenium and silver. Matrix spike recoveries and validation qualification are described in the following tables.

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
PRR1SOLSP-01	Antimony	36%
	Selenium	37%
	Silver	40%

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
PRR1SOLSP-01	Antimony	36%	100%
	Selenium	37%	36%
	Silver	37%	40%

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

6. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1SOLSP-01 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria with the following exceptions. The observed RPD for aluminum, iron, lead and manganese did not meet precision acceptance criteria. Project precision measurement performance criteria were not met for aluminum, iron, lead and manganese. Laboratory duplicate RPD and validation qualification are described in the following tables.

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
PRR1SOLSP-01	Aluminum	23%
	Iron	48%
	Lead	38%
	Manganese	60%

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

7. SERIAL DILUTION

Sample PRR1SOLSP-01 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all elements met method measurement performance criteria with the following exceptions. The observed %D for aluminum, chromium, copper, and iron did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for aluminum, chromium, copper and iron. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1SOLSP-01	Aluminum	14%
	Chromium	21%
	Copper	11%
	Iron	74%

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. REPORTING

Three target analytes were reported from a diluted analysis and are flagged D by the laboratory.

The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

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.

pH DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Bias – The QAPP specified hold time for pH in soil matrix is 48 hours from collection. The laboratory noted a hold time of 15 minutes and flagged the pH result "HF." The analysis was performed three days after collection, which is beyond the QAPP hold time.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group (SDG) was performed beyond the QAPP specified holding time. There is no EPA specified holding time for pH on soil; therefore, accuracy/bias cannot be determined. The sample result was qualified as estimated, J.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

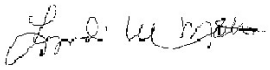
LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1SOLSP-01 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

VALIDATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE: 

DATE: August 25, 2011

PEER REVIEW BY: Dennis Capria

DATE: September 6, 2011

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - PCBs

ANALYTE		PRR1SOLSP-01	LQ	VQ
Aroclor-1016	ug/kg	34	U	U
Aroclor-1221	ug/kg	34	U	U
Aroclor-1232	ug/kg	34	U	U
Aroclor-1242	ug/kg	34	U	U
Aroclor-1248	ug/kg	34	U	U
Aroclor-1254	ug/kg	34	U	U
Aroclor-1260	ug/kg	34	U	U
Aroclor-1262	ug/kg	34	U	U
Aroclor-1268	ug/kg	34	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - Pesticides

ANALYTE		PRR1SOLSP-01	LQ	VQ
2,4'-DDD	ug/kg	3.4	U	U
2,4'-DDE	ug/kg	3.4	U	U
2,4'-DDT	ug/kg	3.4	U	U
4,4'-DDD	ug/kg	3.4	U	U
4,4'-DDE	ug/kg	3.4	U	U
4,4'-DDT	ug/kg	3.4	U	U
Aldrin	ug/kg	1.7	U	U
Alpha-BHC	ug/kg	1.7	U	U
Alpha-Chlordane	ug/kg	1.7	U	U
Beta-BHC	ug/kg	1.7	J P B	UB
Delta-BHC	ug/kg	1.7	U	U
Dieldrin	ug/kg	3.4	U	U
Endosulfan I	ug/kg	1.7	U	U
Endosulfan II	ug/kg	3.4	U	U
Endosulfan Sulfate	ug/kg	3.4	U	U
Endrin	ug/kg	3.4	U	U
Endrin Aldehyde	ug/kg	3.4	U	U
Endrin Ketone	ug/kg	3.4	U	U
Gamma-BHC (Lindane)	ug/kg	1.7	U	U
Gamma-Chlordane	ug/kg	1.7	U	U
Heptachlor	ug/kg	1.7	U	U
Heptachlor Epoxide	ug/kg	1.7	U	U
Methoxychlor	ug/kg	17	U	U
Toxaphene	ug/kg	170	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - VOCs

ANALYTE		PRR1SOLSP-01	LQ	VQ		TB07082011-01	LQ	VQ
1,1-Dichloroethene	ug/kg	7	U	U	ug/L	5	U	U
1,2,3-Trichlorobenzene	ug/kg	7	J B	UB	ug/L	0.11	J B	J B
1,2,4-Trichlorobenzene	ug/kg	7	J B	UB	ug/L	0.21	J B	J B
1,2-Dichlorobenzene	ug/kg	7	U	U	ug/L	5	U	U
1,2-Dichloroethane	ug/kg	7	U	U	ug/L	5	U	U
1,3-Dichlorobenzene	ug/kg	7	U	U	ug/L	5	U	U
1,4-Dichlorobenzene	ug/kg	7	U	U	ug/L	5	U	U
2-Butanone	ug/kg	14	U	U	ug/L	10	U	U
Benzene	ug/kg	7	U	U	ug/L	5	U	U
Carbon Tetrachloride	ug/kg	7	U	U	ug/L	5	U	U
Chlorobenzene	ug/kg	7	U	U	ug/L	5	U	U
Chloroform	ug/kg	7	U	U	ug/L	5	U	U
Ethylbenzene	ug/kg	7	U	U	ug/L	5	U	U
Methylene Chloride	ug/kg	7	U	U	ug/L	5	U	U
Tetrachloroethene	ug/kg	7	U	U	ug/L	5	U	U
Toluene	ug/kg	7	U	U	ug/L	5	U	U
Trichloroethene	ug/kg	7	U	U	ug/L	5	U	U
Vinyl Chloride	ug/kg	7	U	U	ug/L	5	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - SVOCs

ANALYTE		PRR1SOLSP-01	LQ	VQ
1,1'-Biphenyl	ug/kg	180	U	U
1,2,4,5-Tetrachlorobenzene	ug/kg	180	U	U
2,2'-Oxybis(1-Chloropropane)	ug/kg	180	U	U
2,3,4,6-Tetrachlorophenol	ug/kg	180	U	U
2,4,5-Trichlorophenol	ug/kg	180	U	U
2,4,6-Trichlorophenol	ug/kg	180	U	U
2,4-Dichlorophenol	ug/kg	180	U	U
2,4-Dimethylphenol	ug/kg	180	U	U
2,4-Dinitrophenol	ug/kg	340	U	U
2,4-Dinitrotoluene	ug/kg	180	U	U
2,6-Dinitrotoluene	ug/kg	180	U	U
2-Chloronaphthalene	ug/kg	180	U	U
2-Chlorophenol	ug/kg	180	U	U
2-Methylnaphthalene	ug/kg	180	U	U
2-Methylphenol	ug/kg	180	U	U
2-Nitroaniline	ug/kg	340	U	U
2-Nitrophenol	ug/kg	180	U	U
3,3'-Dichlorobenzidine	ug/kg	180	U	U
3-Nitroaniline	ug/kg	340	U	U
4,6-Dinitro-2-methylphenol	ug/kg	340	U	U
4-Bromophenyl-phenylether	ug/kg	180	U	U
4-Chloro-3-Methylphenol	ug/kg	180	U	U
4-Chloroaniline	ug/kg	180	U	U
4-Chlorophenyl-phenylether	ug/kg	180	U	U
4-Methylphenol	ug/kg	180	U	U
4-Nitroaniline	ug/kg	340	U	U
4-Nitrophenol	ug/kg	340	U	U
Acenaphthene	ug/kg	180	U	U
Acenaphthylene	ug/kg	180	U	U
Acetophenone	ug/kg	180	J B	UB
Anthracene	ug/kg	180	U	U
Atrazine	ug/kg	180	U	U
Benzaldehyde	ug/kg	180	U	U
Benzo(a)anthracene	ug/kg	180	U	U
Benzo(a)pyrene	ug/kg	180	U	U
Benzo(b)fluoranthene	ug/kg	180	U	U
Benzo(g,h,i)perylene	ug/kg	180	U	U
Benzo(k)fluoranthene	ug/kg	180	U	U
bis(2-Chloroethoxy)methane	ug/kg	180	U	U
bis(2-Chloroethyl)ether	ug/kg	180	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - SVOCs

ANALYTE		PRR1SOLSP-01	LQ	VQ
bis(2-Ethylhexyl)phthalate	ug/kg	180	J B	UB
Butylbenzylphthalate	ug/kg	180	J B	UB
Caprolactam	ug/kg	180	U	U
Carbazole	ug/kg	180	U	U
Chrysene	ug/kg	180	U	U
Dibenzo(a,h)anthracene	ug/kg	180	U	U
Dibenzofuran	ug/kg	180	U	U
Diethylphthalate	ug/kg	180	U	U
Dimethylphthalate	ug/kg	180	U	U
Di-n-Butylphthalate	ug/kg	180	J B	UB
Di-n-Octylphthalate	ug/kg	180	U	U
Fluoranthene	ug/kg	180	U	U
Fluorene	ug/kg	180	U	U
Hexachlorobenzene	ug/kg	180	U	U
Hexachlorobutadiene	ug/kg	180	U	U
Hexachlorocyclopentadiene	ug/kg	180	U	U
Hexachloroethane	ug/kg	180	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	180	U	U
Isophorone	ug/kg	180	U	U
Naphthalene	ug/kg	180	U	U
Nitrobenzene	ug/kg	180	U	U
N-Nitroso-di-n-propylamine	ug/kg	180	U	U
N-Nitrosodiphenylamine	ug/kg	180	U	U
Pentachlorophenol	ug/kg	340	U	U
Phenanthrene	ug/kg	180	U	U
Phenol	ug/kg	180	U	U
Pyrene	ug/kg	180	U	U
Pyridine	ug/kg	180	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - SVOCs - SIM

ANALYTE		PRR1SOLSP-01	LQ	VQ
2-Methylnaphthalene	ug/kg	3.4	J B	UB
Acenaphthene	ug/kg	3.4	U	U
Acenaphthylene	ug/kg	3.4	U	U
Anthracene	ug/kg	3.4	U	U
Benzo(a)anthracene	ug/kg	3.4	U	U
Benzo(a)pyrene	ug/kg	3.5	B	UB
Benzo(b)fluoranthene	ug/kg	3.4	U	U
Benzo(g,h,i)perylene	ug/kg	3.4	U	U
Benzo(k)fluoranthene	ug/kg	3.4	U	U
Chrysene	ug/kg	3.4	U	U
Dibenzo(a,h)anthracene	ug/kg	3.4	U	U
Fluoranthene	ug/kg	3.4	U	U
Fluorene	ug/kg	3.4	U	U
Hexachlorobenzene	ug/kg	3.4	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	3.4	U	U
Naphthalene	ug/kg	3.4	J B	UB
Pentachlorophenol	ug/kg	7	U	U
Phenanthrene	ug/kg	3.4	U	U
Pyrene	ug/kg	3.4	J B	UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - Inorganics

ANALYTE		PRR1SOLSP-01	LQ	VQ
Aluminum	mg/kg	432	E *	J
Antimony	mg/kg	0.75	U N	UJ
Arsenic	mg/kg	1.4	*	
Barium	mg/kg	3.3	J	J
Beryllium	mg/kg	0.11	J	J
Cadmium	mg/kg	0.075	J	J
Calcium	mg/kg	192,000	D	D
Chromium	mg/kg	3.2	E	J
Cobalt	mg/kg	2.2	J	J
Copper	mg/kg	5.2	E	J
Iron	mg/kg	3,310	*	J
Lead	mg/kg	6.6	*	J
Magnesium	mg/kg	110,000	D	D
Manganese	mg/kg	170	D *	DJ
Mercury	mg/kg	0.098	U	U
Nickel	mg/kg	4.9		
Potassium	mg/kg	334	J	J
Selenium	mg/kg	0.06	J N	J
Silver	mg/kg	0.38	U N	UJ
Sodium	mg/kg	109	J	J
Thallium	mg/kg	0.075	J	J
Vanadium	mg/kg	5.5		
Zinc	mg/kg	2.6	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - Herbicides

ANALYTE		PRR1SOLSP-01	LQ	VQ
2,4,5-T	ug/kg	9.7	U	U
2,4,5-TP	ug/kg	3.9	U	U
2,4-D	ug/kg	39	U	U
2,4-DB	ug/kg	19	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - Miscellaneous

ANALYTE		PRR1SOLSP-01	LQ	VQ
Percent Moisture	%	1.8		
Percent Solids	%	98.2		
pH	SU	9.25	HF	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1140 - Grain Size

ANALYTE		PRR1SOLSP-01	LQ	VQ
Grain Size				
Gravel	%	3		
Sand	%	95.4		
Coarse Sand	%	68.9		
Medium Sand	%	25		
Fine Sand	%	1.4		
Silt	%	0.1		
Clay	%	1.5		
Grain Size-Sieve				
75000 um	% passing	100		
50000 um	% passing	100		
37500 um	% passing	100		
25000 um	% passing	100		
19000 um	% passing	100		
9500 um	% passing	100		
4750 um	% passing	97		
2000 um	% passing	28.1		
850 um	% passing	7.2		
425 um	% passing	3.1		
250 um	% passing	2.3		
180 um	% passing	2.1		
150 um	% passing	2		
75 um	% passing	1.7		
Grain Size-Hydrometer				
37.3 um	% passing	1.5		
23.6 um	% passing	1.5		
13.6 um	% passing	1.5		
9.6 um	% passing	1.5		
6.9 um	% passing	1.5		
3.3 um	% passing	1.5		
1.4 um	% passing	0.9		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 29.4 (g/mL) g Lab File ID: PHV13.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 2.0 Decanted: (Y/N) N Date Received: 07/09/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/15/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/22/2011

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	180	U
100-52-7	Benzaldehyde	180	U
108-95-2	Phenol	180	U
111-44-4	Bis(2-chloroethyl)ether	180	U
95-57-8	2-Chlorophenol	180	U
95-48-7	2-Methylphenol	180	U
108-60-1	2,2'-Oxybis(1-chloropropane)	180	U
98-86-2	Acetophenone	180 ~~8.2~~	~~J B~~ UB
106-44-5	4-Methylphenol	180	U
621-64-7	N-Nitroso-di-n-propylamine	180	U
67-72-1	Hexachloroethane	180	U
98-95-3	Nitrobenzene	180	U
78-59-1	Isophorone	180	U
88-75-5	2-Nitrophenol	180	U
105-67-9	2,4-Dimethylphenol	180	U
111-91-1	Bis(2-chloroethoxy)methane	180	U
120-83-2	2,4-Dichlorophenol	180	U
91-20-3	Naphthalene	180	U
106-47-8	4-Chloroaniline	180	U
87-68-3	Hexachlorobutadiene	180	U
105-60-2	Caprolactam	180	U
59-50-7	4-Chloro-3-methylphenol	180	U
91-57-6	2-Methylnaphthalene	180	U
77-47-4	Hexachlorocyclopentadiene	180	U
88-06-2	2,4,6-Trichlorophenol	180	U
95-95-4	2,4,5-Trichlorophenol	180	U
92-52-4	1,1'-Biphenyl	180	U
91-58-7	2-Chloronaphthalene	180	U
88-74-4	2-Nitroaniline	340	U
131-11-3	Dimethylphthalate	180	U
606-20-2	2,6-Dinitrotoluene	180	U
208-96-8	Acenaphthylene	180	U
99-09-2	3-Nitroaniline	340	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 29.4 (g/mL) g Lab File ID: PHV13.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 2.0 Decanted: (Y/N) N Date Received: 07/09/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/15/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/22/2011

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg		Q
83-32-9	Acenaphthene		180	U
51-28-5	2,4-Dinitrophenol		340	U
100-02-7	4-Nitrophenol		340	U
132-64-9	Dibenzofuran		180	U
121-14-2	2,4-Dinitrotoluene		180	U
84-66-2	Diethylphthalate		180	U
86-73-7	Fluorene		180	U
7005-72-3	4-Chlorophenyl-phenylether		180	U
100-01-6	4-Nitroaniline		340	U
534-52-1	4,6-Dinitro-2-methylphenol		340	U
86-30-6	N-Nitrosodiphenylamin[1]		180	U
95-94-3	1,2,4,5-Tetrachlorobenzene		180	U
101-55-3	4-Bromophenyl-phenylether		180	U
118-74-1	Hexachlorobenzene		180	U
1912-24-9	Atrazine		180	U
87-86-5	Pentachlorophenol		340	U
85-01-8	Phenanthrene		180	U
120-12-7	Anthracene		180	U
86-74-8	Carbazole		180	U
84-74-2	Di-n-butylphthalate	180	~~13~~	~~J B~~ UB
206-44-0	Fluoranthene		180	U
129-00-0	Pyrene		180	U
85-68-7	Butylbenzylphthalate	180	~~6.1~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine		180	U
56-55-3	Benzo(a)anthracene		180	U
218-01-9	Chrysene		180	U
117-81-7	Bis(2-ethylhexyl)phthalate	180	~~8.0~~	~~J B~~ UB
117-84-0	Di-n-octylphthalate		180	U
205-99-2	Benzo(b)fluoranthene		180	U
207-08-9	Benzo(k)fluoranthene		180	U
50-32-8	Benzo(a)pyrene		180	U
193-39-5	Indeno(1,2,3-cd)pyrene		180	U
53-70-3	Dibenzo(a,h)anthracene		180	U
191-24-2	Benzo(g,h,i)perylene		180	U
58-90-2	2,3,4,6-Tetrachlorophenol		180	U

[1]Cannot be separated from Diphenylamine

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 29.4 (g/mL) g Lab File ID: ZWSMS03.D

Extraction: (Type) SONC

% Moisture: 2.0 Decanted: (Y/N) N Date Received: 07/09/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/15/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/20/2011

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	3.4 ~~0.44~~	~~J B~~ UB
91-57-6	2-Methylnaphthalene	3.4 ~~0.13~~	~~J B~~ UB
208-96-8	Acenaphthylene	3.4	U
83-32-9	Acenaphthene	3.4	U
86-73-7	Fluorene	3.4	U
118-74-1	Hexachlorobenzene	3.4	U
87-86-5	Pentachlorophenol	7.0	U
85-01-8	Phenanthrene	3.4	U
120-12-7	Anthracene	3.4	U
206-44-0	Fluoranthene	3.4	U
129-00-0	Pyrene	3.4 ~~1.2~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	3.4	U
218-01-9	Chrysene	3.4	U
205-99-2	Benzo(b)fluoranthene	3.4	U
207-08-9	Benzo(k)fluoranthene	3.4	U
50-32-8	Benzo(a)pyrene	3.5	~~J~~ UB
193-39-5	Indeno(1,2,3-cd)pyrene	3.4	U
53-70-3	Dibenz(a,h)anthracene	3.4	U
191-24-2	Benzo(g,h,i)perylene	3.4	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLSP-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 3.62 (g/mL) g Lab File ID: NEQA05.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/09/2011

% Moisture: not dec. 1.8 Date Analyzed: 07/12/2011

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
75-01-4	Vinyl chloride	7.0		U
75-35-4	1,1-Dichloroethene	7.0		U
75-09-2	Methylene chloride	7.0		U
78-93-3	2-Butanone	14		U
67-66-3	Chloroform	7.0		U
56-23-5	Carbon tetrachloride	7.0		U
71-43-2	Benzene	7.0		U
107-06-2	1,2-Dichloroethane	7.0		U
79-01-6	Trichloroethene	7.0		U
108-88-3	Toluene	7.0		U
127-18-4	Tetrachloroethene	7.0		U
108-90-7	Chlorobenzene	7.0		U
100-41-4	Ethylbenzene	7.0		U
541-73-1	1,3-Dichlorobenzene	7.0		U
106-46-7	1,4-Dichlorobenzene	7.0		U
95-50-1	1,2-Dichlorobenzene	7.0		U
120-82-1	1,2,4-Trichlorobenzene	7.0	~~0.49~~	~~J B~~ UB
87-61-6	1,2,3-Trichlorobenzene	7.0	~~0.50~~	~~J B~~ UB

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB07082011-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-5934-2

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MHDA09.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/09/2011

% Moisture: not dec. Date Analyzed: 07/12/2011

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
75-01-4	Vinyl chloride	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	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
79-01-6	Trichloroethene	5.0	U
108-88-3	Toluene	5.0	U
127-18-4	Tetrachloroethene	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	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
120-82-1	1,2,4-Trichlorobenzene	0.21	J B
87-61-6	1,2,3-Trichlorobenzene	0.11	J B

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 21JUL111245-R061.D

% Moisture: 2.0 Decanted: (Y/N) N Date Received: 07/09/2011

Extraction: (Type) SONC Date Extracted: 07/19/2011

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/21/2011

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.0 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7 ~~0.15~~	~~J P B~~ (13)
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.4	U
72-55-9	4,4'-DDE	3.4	U
72-20-8	Endrin	3.4	U
33213-65-9	Endosulfan II	3.4	U
72-54-8	4,4'-DDD	3.4	U
1031-07-8	Endosulfan sulfate	3.4	U
50-29-3	4,4'-DDT	3.4	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.4	U
7421-93-4	Endrin aldehyde	3.4	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
8001-35-2	Toxaphene	170	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 22JUL110858-R031.D

% Moisture: 2.0 Decanted: (Y/N) N Date Received: 07/09/2011

Extraction: (Type) SONC Date Extracted: 07/19/2011

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/22/2011

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.0 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.4	U
789-02-6	2,4'-DDT	3.4	U
53-19-0	2,4'-DDD	3.4	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-5934-2

SDG No.: PRR1140

Client Sample ID: PRR1SOLSP-01 | Lab Sample ID: 200-5934-1

Matrix: Solid | Lab File ID: 21jul111114-r031.d

Analysis Method: 8151A | Date Collected: 07/08/2011 11:00

Extraction Method: 8151A | Date Extracted: 07/16/2011 11:21

Sample wt/vol: 50.02(g) | Date Analyzed: 07/21/2011 12:06

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 2.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 22017 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	39	U	39	5.7
94-82-6	2,4-DB	19	U	19	7.4
93-76-5	2,4,5-T	9.7	U	9.7	1.5
93-72-1	Silvex (2,4,5-TP)	3.9	U	3.9	0.46

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	86		25-195

EPA SAMPLE NO.
PRR1SOLSP-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1140

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-5934-1

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 21JUL111053-R031.D

% Moisture: 2.0 Decanted: (Y/N) N Date Received: 07/09/2011

Extraction: (Type) SONC Date Extracted: 07/12/2011

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 07/21/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.0 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	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
37324-23-5	Aroclor-1262	34	U
11100-14-4	Aroclor-1268	34	U

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLSP-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1140
Matrix: SOIL Lab Sample Id: 200-5934-1
% Solids: 98.0 Date Received: 07/09/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	432		~~E~~ J	P
7440-38-2	Arsenic	1.4		J	P
7440-39-3	Barium	3.3	J		P
7440-41-7	Beryllium	0.11	J		P
7440-43-9	Cadmium	0.075	J		P
7440-70-2	Calcium	192000		D	P
7440-47-3	Chromium	3.2		~~E~~ J	P
7440-48-4	Cobalt	2.2	J		P
7440-50-8	Copper	5.2		~~E~~ J	P
7439-89-6	Iron	3310		J ~~E~~ J	P
7439-92-1	Lead	6.6		J J	P
7439-95-4	Magnesium	110000		D	P
7439-96-5	Manganese	170		D J	P
7440-02-0	Nickel	4.9			P
7440-09-7	Potassium	334	J		P
7440-23-5	Sodium	109	J		P
7440-62-2	Vanadium	5.5			P
7440-66-6	Zinc	2.6	J		P

Color Before: LIGHT BROWN Clarity Before: Texture: FINE
Color After: PALE YELLOW Clarity After: CLOUDY Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLSP-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1140

Matrix: SOIL Lab Sample Id: 200-5934-1

% Solids: 98.0 Date Received: 07/09/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.75	U	✗ UJ	MS
7782-49-2	Selenium	0.060	J	✗ J	MS
7440-22-4	Silver	0.38	U	✗ UJ	MS
7440-28-0	Thallium	0.38 ~~0.075~~	✗	UB	MS

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: CLOUDY Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLSP-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1140

Matrix: SOIL Lab Sample Id: 200-5934-1

% Solids: 98.0 Date Received: 07/09/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.098	U		CV

Color Before: GRAY Clarity Before: Texture: COARSE

Color After: LIGHT YELLOW Clarity After: CLEAR Artifacts: ROCKS

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLSP-01 Lab Sample ID: 200-5934-1

Lab Name: TestAmerica Burlington Job No.: 200-5934-2

SDG ID.: PRR1140

Matrix: Solid Date Sampled: 07/08/2011 11:00

Reporting Basis: WET Date Received: 07/09/2011 09:40

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.25			SU		~~HF~~ J	1	9045C

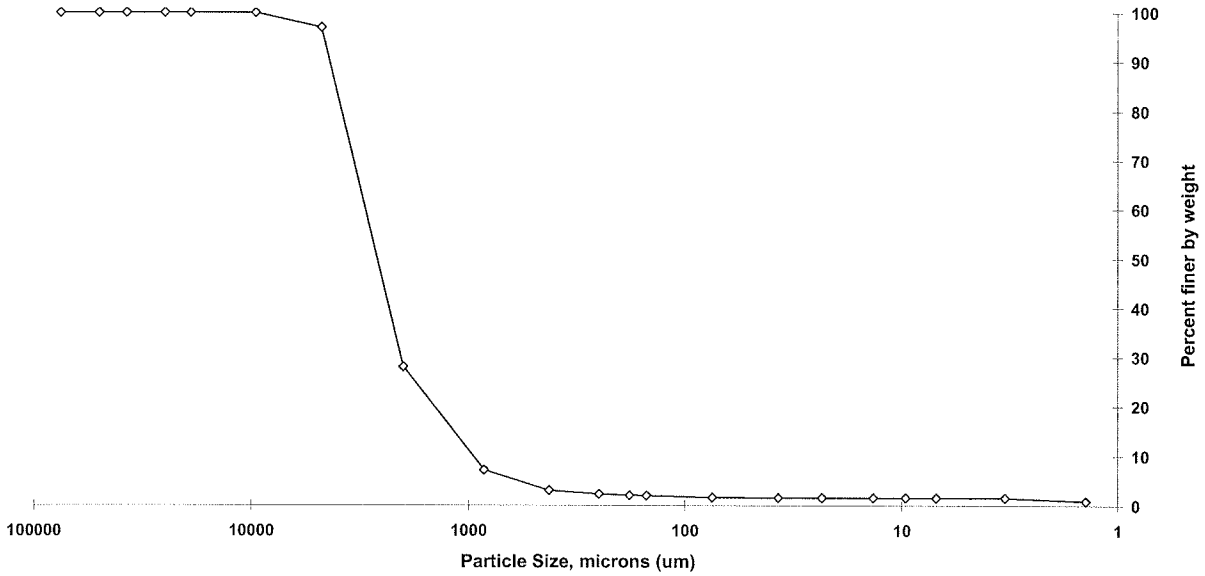
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLSP-01	**Percent Solids:**	97.9%	**Date Received:**	07/09/11
Lab ID:	200-5934-AA-1	**Specific Gravity:**	2.650	**Start Date:**	07/15/11
				End Date:	07/20/11

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	97.0	3.0
#10	2000	28.1	68.9
#20	850	7.2	20.9
#40	425	3.1	4.1
#60	250	2.3	0.8
#80	180	2.1	0.2
#100	150	2.0	0.1
#200	75	1.7	0.3
Hyd1	37.3	1.5	0.1
Hyd2	23.6	1.5	0.0
Hyd3	13.6	1.5	0.0
Hyd4	9.6	1.5	0.0
Hyd5	6.9	1.5	0.0
Hyd6	3.3	1.5	0.0
Hyd7	1.4	0.9	0.6

Soil Classification	Percent of sample
Gravel	3.0
Sand	95.4
Coarse Sand	68.9
Medium Sand	25.0
Fine Sand	1.4
Silt	0.1
Clay	1.5

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #:

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Removal Action Work Plan Quality Assurance Project Plan	PRR1140	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1SOLSP-01	7/8/2011	11:00	Soil	Composite	29	X	X	X	X	X	X	X	X													
TB07082011-01	7/8/2011		Water		3		X																			

Requested Analyses	Special Instructions/Comments:	☐ Special QA/QC Instructions
1 SVOC		
2 VOC		
3 Aroclor PCBs		
4 Metals		
5 Chlorinated Herbicides		
6 Pesticides		
7 pH		
8 Grain Size		
9 TCLP		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Laboratory Information and Receipt

Lab Name: Test America - Burlington, VT	☐ Cooler packed with ice	Sample Receipt:
Shipping Tracking #: 794954095648, 794954095615		
Specify Turnaround Requirements: 14-day	☐ Cooler custody seal intact	Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	7/8/2011	1830	7/9/11 940				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1141 (200-6164)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #14588R VAL
Project: B0009966.0002.70006

SUMMARY

This data quality validation report summarizes the review of Sample Delivery Group (SDG) #PRR1141 (200-6164) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOPs; USEPA National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010); and EPA Region 2 Data Validation SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation and validation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1SOLIF-01	200-6164-01	Soil	7/22/2011		X	X	X	X	X
PRR1SOLIF-02	200-6164-02	Soil	7/22/2011		X	X	X	X	X
TB07222011-01	200-6164-04	Water	7/22/2011		X				

Miscellaneous parameters include Chlorinated Herbicides by SW846 8151A, pH by SW846 9045C and Particle Size by ASTM D422.
Volatiles, Semivolatiles, Pesticides, Aroclor PCBs by USEPA SOM0.1.2.
Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of acetophenone and bis(2-ethylhexyl) phthalate. These compounds were detected in the samples at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

All analytes 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
PRR1SOLIF-01 PRR1SOLIF-02	Acetophenone Bis(2-ethylhexyl)phthalate	<PQL[1]	Detected sample results <PQL	UB at the PQL

PQL = 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 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 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 compounds associated with the calibrations were within the specified control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries greater than the established acceptance limits for anthracene-d10. Surrogate recoveries and validation qualification are described in the following tables.

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

Sample Locations	Surrogate	Recovery
PRR1SOLIF-01 PRR1SOLIF-02	Phenol-d5	AC
	Bis(2-chloroethyl)ether-d8	AC

Sample Locations	Surrogate	Recovery
PRR1SOLIF-01 PRR1SOLIF-02	2-Chlorophenol-d4	AC
	4-Methylphenol-d8	AC
	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
	Fluorene-d10	AC
	4,6-Dinitro-2-methylphenol-d2	AC
	Anthracene-d10	> UL
	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

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)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for semivolatile analysis. Five recoveries were greater than acceptable limits. Matrix spike recoveries and validation qualification are described in the following tables.

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
PRR1SOLIF-01	Phenol	>UL	> UL
	4-Chloro-3-methylphenol	>UL	AC
	2,4-Dinitrotoluene	>UL	> 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

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.

Qualifier	Description
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

SEMIVOLATILE SIM DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of naphthalene, pyrene, and benzo(a)pyrene. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Benzo(a)pyrene was observed in the associated method blank above the project quantitation limits (PQL).

All analytes 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
PRR1SOLIF-01 PRR1SOLIF-02	Naphthalene Pyrene	<PQL	Detected sample results <PQL	UB at the PQL
	Benzo(a)pyrene	>PQL	Detected sample results >PQL and < blank concentration	UB at detected sample concentration

PQL = reporting limit is equal to the low point of the initial calibration curve.

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 compounds associated with the calibrations were within the specified control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blank exhibited surrogate recoveries within the established acceptance 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)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for semivolatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

VOLATILE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of trichloroethene, methylene chloride, toluene, 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene. These compounds were detected in the samples and the trip blank at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

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
PRR1SOLIF-01 PRR1SOLIF-02	Methylene chloride Toluene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene	<PQL[1]	Detected sample results <PQL	UB at the PQL

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

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 calibration criteria were within the control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance 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 areas and retention times were within established limits.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for volatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

PESTICIDE and 2,4-DDX SERIES DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC. This compound was detected in the sample at a concentration less than five times the method blank concentration; therefore, beta-BHC in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

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
PRR1SOLIF-01 PRR1SOLIF-02	beta-BHC	<PQL	Detected sample results <PQL	UB at the PQL

PQL Practical Quantitation 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

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for pesticide analysis. All recoveries were observed within acceptable limits.

7. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

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. 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 did not meet %D criteria for beta-BHC. The sample results were revised to non-detect due to method blank contamination. Therefore, no qualification is required for the dual column analysis.

11. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

12. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

13. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

14. Overall Assessment

Overall 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.

AROCLOR PCB DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

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

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for PCB analysis. All recoveries were observed within acceptable limits.

7. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

8. 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%.

Aroclor PCBs were not detected in the samples.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for Aroclor analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

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 is allowed.

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

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

6. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for herbicide analysis. All recoveries were observed within acceptable limits.

8. 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 40%.

Herbicides were not detected in the samples.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for herbicide analyses is greater than 40 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

TOTAL METALS DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

Accuracy/Bias – The matrix spike recoveries were less than 30% for fifteen analytes, indicating potential low bias for positive and non-detect results for the affected analytes in the associated samples. Project accuracy measurement performance criteria were not met for the affected analytes.

Minor

Precision – The laboratory duplicate difference between the sample result and the duplicate result was greater than the acceptance limit for one analytes, indicating matrix interferences. Project bias measurement performance criteria were not met for the affected analytes.

Matrix Interference – The serial dilution percent difference (%D) were greater than the acceptance limit for ten analytes. Project accuracy measurement performance criteria were not met for the affected analytes.

Accuracy/Bias - The method blank exhibited low level concentration of thallium. This analyte was detected in the sample at a concentration less than five times the method blank concentration; therefore, thallium in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

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	Analyte	Blank Result	Sample Result	Qualification
PRR1SOLIF-01 PRR1SOLIF-02	Thallium	<PQL	Detected sample results <PQL	UB at the PQL

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 continuing calibration verification standard recoveries were within the control limit.

3.2 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

5. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

Sample PRR1SOLIF-01 was selected for MS analysis. The result of this evaluation was that many elements had observed spike recoveries less than 30%, which is below the control limits (75-125%). The observed recoveries for the analytes listed in the table below did not meet accuracy acceptance criteria, indicating potential low bias in associated samples. Project accuracy/bias measurement performance criteria were not met. Matrix spike recoveries and validation qualification are described in the following tables.

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
PRR1SOLIF-01	Antimony	15%
	Arsenic	0%
	Barium	0%
	Beryllium	0%
	Cadmium	0%
	Chromium	0%
	Cobalt	0%
	Copper	0%
	Lead	8%
	Manganese	10%
	Nickel	0%
	Selenium	22%
	Silver	20%
	Vanadium	0%
	Zinc	0%

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
PRR1SOLIF-01	Antimony	15%	96%
	Arsenic	0%	0%
	Barium	0%	16%
	Beryllium	0%	0%
	Cadmium	0%	0%

Sample Location	Analyte	MS Recovery	PS Recovery
	Chromium	0%	2%
	Cobalt	0%	4%
	Copper	0%	0%
	Lead	8%	4%
	Manganese	10%	137%
	Nickel	0%	0%
	Selenium	22%	24%
	Silver	20%	21%
	Vanadium	0%	8%
	Zinc	0%	0%

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

6. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1SOLIF-01 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria with the following exceptions. The observed difference between the sample result and the duplicate result for nickel did not meet precision acceptance criteria. Project precision measurement performance criteria were not met for nickel. Laboratory duplicate RPD and validation qualification are described in the following tables.

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
PRR1SOLIF-01	Nickel	130%

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/or laboratory duplicate sample result ≤ five times the PQL and difference between samples >PQL	Two times the PQL	Non-detect	UJ
		Detect	J

7. SERIAL DILUTION

Sample PRR1SOLIF-01 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all elements met method measurement performance criteria with the following exceptions. The observed %D for aluminum, calcium, chromium, cobalt, copper, iron, magnesium, nickel, potassium and vanadium did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1SOLIF-01	Aluminum	24%
	Calcium	23%
	Chromium	42%
	Cobalt	17%
	Copper	15%
PRR1SOLIF-01	Iron	22%
	Magnesium	23%
	Nickel	69%
	Potassium	12%
	Vanadium	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
> 10%	Non-detect	UJ
	Detect	J

8. REPORTING

Many target analytes were reported from a diluted analysis and are flagged D by the laboratory.

The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

pH DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Bias – The QAPP specified hold time for pH in soil matrix is 48 hours from collection. The laboratory noted a hold time of 15 minutes and flagged the pH result "HF." The analysis was performed three days after collection, which is beyond the QAPP specified hold time.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group (SDG) was performed beyond the QAPP specified holding time. There is no EPA specified holding time for pH on soil; therefore, accuracy/bias cannot be determined. The sample result was qualified as estimated, J.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

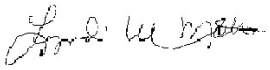
LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1SOLIF-01 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

VALIDATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE: 

DATE: August 26, 2011

PEER REVIEW BY: Dennis Capria

DATE: September 6, 2011

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - PCBs

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
Aroclor-1016	ug/kg	33	U	U	26	U	U
Aroclor-1221	ug/kg	33	U	U	26	U	U
Aroclor-1232	ug/kg	33	U	U	26	U	U
Aroclor-1242	ug/kg	33	U	U	26	U	U
Aroclor-1248	ug/kg	33	U	U	26	U	U
Aroclor-1254	ug/kg	33	U	U	26	U	U
Aroclor-1260	ug/kg	33	U	U	26	U	U
Aroclor-1262	ug/kg	33	U	U	26	U	U
Aroclor-1268	ug/kg	33	U	U	26	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - Pesticides

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
2,4'-DDD	ug/kg	3.3	U	U	2.6	U	U
2,4'-DDE	ug/kg	3.3	U	U	2.6	U	U
2,4'-DDT	ug/kg	3.3	U	U	2.6	U	U
4,4'-DDD	ug/kg	3.3	U	U	2.6	U	U
4,4'-DDE	ug/kg	3.3	U	U	2.6	U	U
4,4'-DDT	ug/kg	3.3	U	U	2.6	U	U
Aldrin	ug/kg	1.7	U	U	1.3	U	U
Alpha-BHC	ug/kg	1.7	U	U	1.3	U	U
Alpha-Chlordane	ug/kg	1.7	U	U	1.3	U	U
Beta-BHC	ug/kg	1.7	J P B	UB	1.3	J P B	UB
Delta-BHC	ug/kg	1.7	U	U	1.3	U	U
Dieldrin	ug/kg	3.3	U	U	2.6	U	U
Endosulfan I	ug/kg	1.7	U	U	1.3	U	U
Endosulfan II	ug/kg	3.3	U	U	2.6	U	U
Endosulfan Sulfate	ug/kg	3.3	U	U	2.6	U	U
Endrin	ug/kg	3.3	U	U	2.6	U	U
Endrin Aldehyde	ug/kg	3.3	U	U	2.6	U	U
Endrin Ketone	ug/kg	3.3	U	U	2.6	U	U
Gamma-BHC (Lindane)	ug/kg	1.7	U	U	1.3	U	U
Gamma-Chlordane	ug/kg	1.7	U	U	1.3	U	U
Heptachlor	ug/kg	1.7	U	U	1.3	U	U
Heptachlor Epoxide	ug/kg	1.7	U	U	1.3	U	U
Methoxychlor	ug/kg	17	U	U	13	U	U
Toxaphene	ug/kg	170	U	U	130	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - VOCs

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ		TB07222011-01	LQ	VQ
1,1-Dichloroethene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
1,2,3-Trichlorobenzene	ug/kg	6.6	J B	UB	4.7	J B	UB	ug/L	0.52	J B	J B
1,2,4-Trichlorobenzene	ug/kg	6.6	J B	UB	4.7	J B	UB	ug/L	0.57	J B	J B
1,2-Dichlorobenzene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
1,2-Dichloroethane	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
1,3-Dichlorobenzene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
1,4-Dichlorobenzene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
2-Butanone	ug/kg	13	U	U	9.4	U	U	ug/L	10	U	U
Benzene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
Carbon Tetrachloride	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
Chlorobenzene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
Chloroform	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
Ethylbenzene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
Methylene Chloride	ug/kg	6.6	J B	UB	4.7	J B	UB	ug/L	0.11	J	J
Tetrachloroethene	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U
Toluene	ug/kg	6.6	J B	UB	4.7	J B	UB	ug/L	5	U	U
Trichloroethene	ug/kg	6.6	U	U	4.7	U	U	ug/L	0.24	J B	J B
Vinyl Chloride	ug/kg	6.6	U	U	4.7	U	U	ug/L	5	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - SVOCs

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
1,1'-Biphenyl	ug/kg	170	U	U	140	U	U
1,2,4,5-Tetrachlorobenzene	ug/kg	170	U	U	140	U	U
2,2'-Oxybis(1-Chloropropane)	ug/kg	170	U	U	140	U	U
2,3,4,6-Tetrachlorophenol	ug/kg	170	U	U	140	U	U
2,4,5-Trichlorophenol	ug/kg	170	U	U	140	U	U
2,4,6-Trichlorophenol	ug/kg	170	U	U	140	U	U
2,4-Dichlorophenol	ug/kg	170	U	U	140	U	U
2,4-Dimethylphenol	ug/kg	170	U	U	140	U	U
2,4-Dinitrophenol	ug/kg	330	U	U	260	U	U
2,4-Dinitrotoluene	ug/kg	170	U	U	140	U	U
2,6-Dinitrotoluene	ug/kg	170	U	U	140	U	U
2-Chloronaphthalene	ug/kg	170	U	U	140	U	U
2-Chlorophenol	ug/kg	170	U	U	140	U	U
2-Methylnaphthalene	ug/kg	170	U	U	140	U	U
2-Methylphenol	ug/kg	170	U	U	140	U	U
2-Nitroaniline	ug/kg	330	U	U	260	U	U
2-Nitrophenol	ug/kg	170	U	U	140	U	U
3,3'-Dichlorobenzidine	ug/kg	170	U	U	140	U	U
3-Nitroaniline	ug/kg	330	U	U	260	U	U
4,6-Dinitro-2-methylphenol	ug/kg	330	U	U	260	U	U
4-Bromophenyl-phenylether	ug/kg	170	U	U	140	U	U
4-Chloro-3-Methylphenol	ug/kg	170	U	U	140	U	U
4-Chloroaniline	ug/kg	170	U	U	140	U	U
4-Chlorophenyl-phenylether	ug/kg	170	U	U	140	U	U
4-Methylphenol	ug/kg	170	U	U	140	U	U
4-Nitroaniline	ug/kg	330	U	U	260	U	U
4-Nitrophenol	ug/kg	330	U	U	260	U	U
Acenaphthene	ug/kg	170	U	U	140	U	U
Acenaphthylene	ug/kg	170	U	U	140	U	U
Acetophenone	ug/kg	170	J B	UB	140	J B	UB
Anthracene	ug/kg	170	U	U	140	U	U
Atrazine	ug/kg	170	U	U	140	U	U
Benzaldehyde	ug/kg	170	U	U	140	U	U
Benzo(a)anthracene	ug/kg	170	U	U	140	U	U
Benzo(a)pyrene	ug/kg	170	U	U	140	U	U
Benzo(b)fluoranthene	ug/kg	170	U	U	140	U	U
Benzo(g,h,i)perylene	ug/kg	170	U	U	140	U	U
Benzo(k)fluoranthene	ug/kg	170	U	U	140	U	U
bis(2-Chloroethoxy)methane	ug/kg	170	U	U	140	U	U
bis(2-Chloroethyl)ether	ug/kg	170	U	U	140	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - SVOCs

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
bis(2-Ethylhexyl)phthalate	ug/kg	170	J B	UB	140	J B	UB
Butylbenzylphthalate	ug/kg	17	J	J	140	U	U
Caprolactam	ug/kg	170	U	U	140	U	U
Carbazole	ug/kg	170	U	U	140	U	U
Chrysene	ug/kg	170	U	U	140	U	U
Dibenzo(a,h)anthracene	ug/kg	170	U	U	140	U	U
Dibenzofuran	ug/kg	170	U	U	140	U	U
Diethylphthalate	ug/kg	170	U	U	140	U	U
Dimethylphthalate	ug/kg	170	U	U	140	U	U
Di-n-Butylphthalate	ug/kg	170	U	U	140	U	U
Di-n-Octylphthalate	ug/kg	170	U	U	140	U	U
Fluoranthene	ug/kg	170	U	U	140	U	U
Fluorene	ug/kg	170	U	U	140	U	U
Hexachlorobenzene	ug/kg	170	U	U	140	U	U
Hexachlorobutadiene	ug/kg	170	U	U	140	U	U
Hexachlorocyclopentadiene	ug/kg	170	U	U	140	U	U
Hexachloroethane	ug/kg	170	U	U	140	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	170	U	U	140	U	U
Isophorone	ug/kg	170	U	U	140	U	U
Naphthalene	ug/kg	170	U	U	140	U	U
Nitrobenzene	ug/kg	170	U	U	140	U	U
N-Nitroso-di-n-propylamine	ug/kg	170	U	U	140	U	U
N-Nitrosodiphenylamine	ug/kg	170	U	U	140	U	U
Pentachlorophenol	ug/kg	330	U	U	260	U	U
Phenanthrene	ug/kg	170	U	U	140	U	U
Phenol	ug/kg	170	U	U	140	U	U
Pyrene	ug/kg	170	U	U	140	U	U
Pyridine	ug/kg	170	U	U	140	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - SVOCs - SIM

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
2-Methylnaphthalene	ug/kg	3.3	U	U	2.6	U	U
Acenaphthene	ug/kg	3.3	U	U	2.6	U	U
Acenaphthylene	ug/kg	3.3	U	U	2.6	U	U
Anthracene	ug/kg	3.3	U	U	2.6	U	U
Benzo(a)anthracene	ug/kg	0.39	J	J	0.1	J	J
Benzo(a)pyrene	ug/kg	4.4	B	UB	2.9	B	UB
Benzo(b)fluoranthene	ug/kg	0.68	J	J	0.14	J	J
Benzo(g,h,i)perylene	ug/kg	1.1	J	J	0.19	J	J
Benzo(k)fluoranthene	ug/kg	0.64	J	J	0.17	J	J
Chrysene	ug/kg	0.52	J	J	0.12	J	J
Dibenzo(a,h)anthracene	ug/kg	3.3	U	U	2.6	U	U
Fluoranthene	ug/kg	0.64	J	J	0.31	J	J
Fluorene	ug/kg	3.3	U	U	2.6	U	U
Hexachlorobenzene	ug/kg	3.3	U	U	2.6	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	0.41	J	J	0.094	J	J
Naphthalene	ug/kg	3.3	J B	UB	2.6	J B	UB
Pentachlorophenol	ug/kg	6.8	U	U	5.3	U	U
Phenanthrene	ug/kg	0.4	J	J	2.6	U	U
Pyrene	ug/kg	3.3	J B	UB	2.6	J B	UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - Inorganics

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
Aluminum	mg/kg	5,660	D E	J	1,650	E	J
Antimony	mg/kg	1	U N	UJ	0.68	U N	UJ
Arsenic	mg/kg	1.2	J D N	J		U N	R
Barium	mg/kg	77.9	D E N	J	12.1	J E N	J
Beryllium	mg/kg		U N	R		U N	R
Cadmium	mg/kg	0.11	J D N	J	0.061	J N	J
Calcium	mg/kg	5,560	D E	J	2,040	E	J
Chromium	mg/kg	4.2	N E	J	5.4	N E	J
Cobalt	mg/kg	8	D E N	J	2.1	J E N	J
Copper	mg/kg	14.5	D E * N	J	2.2	E * N	J
Iron	mg/kg	20,400	D E	J	4,010	E	J
Lead	mg/kg	0.43	J N	J		U N	R
Magnesium	mg/kg	4,120	D E	J	1,770	E	J
Manganese	mg/kg	204	D N	J	55	D N	J
Mercury	mg/kg	0.093	U	U	0.09	U	U
Nickel	mg/kg	24.7	D E * N	J	4.3	E * N	J
Potassium	mg/kg	2,880	D E	J	770	E	J
Selenium	mg/kg		U N	R		U N	R
Silver	mg/kg		U N	R		U N	R
Sodium	mg/kg	26	J D	J D	107	J	J
Thallium	mg/kg	0.50	J	UB	0.34	J	UB
Vanadium	mg/kg	14.7	D E N	J	4.3	J E N	J
Zinc	mg/kg	38.6	D * N	J	6.2	* N	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - Herbicides

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
2,4,5-T	ug/kg	9.7	U	U	9.6	U	U
2,4,5-TP	ug/kg	3.9	U	U	3.9	U	U
2,4-D	ug/kg	39	U	U	39	U	U
2,4-DB	ug/kg	19	U	U	19	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - Miscellaneous

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
Percent Moisture	%	1.9			0.31		
Percent Solids	%	98.1			99.7		
pH	SU	8.39	HF	J	9.27	HF	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141 - Grain Size

ANALYTE		PRR1SOLIF-01	LQ	VQ	PRR1SOLIF-02	LQ	VQ
Grain Size							
Gravel	%	36.3			98		
Sand	%	54.8			0.66		
Coarse Sand	%	19.5			0.27		
Medium Sand	%	22.9			0		
Fine Sand	%	12.4			0.39		
Silt	%	6.1			NA		
Clay	%	2.9			NA		
Fines	%	NA			1.1		
Grain Size-Sieve							
75000	% passing	100			100		
50000	% passing	100			100		
37500	% passing	100			100		
25000	% passing	100			100		
19000	% passing	100			83		
9500	% passing	82.8			23		
4750	% passing	63.7			1.8		
2000	% passing	44.2			1.5		
850	% passing	29.7			1.5		
425	% passing	21.3			1.5		
250	% passing	16.3			1.5		
180	% passing	14			1.5		
150	% passing	12.8			1.4		
75	% passing	8.9			1.1		
Grain Size-Hydrometer							
35.2	% passing	7.4			NA		
22.5	% passing	6.3			NA		
13.2	% passing	4.6			NA		
9.4	% passing	4.1			NA		
6.6	% passing	2.9			NA		
3.4	% passing	2.9			NA		
1.4	% passing	1.8			NA		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 30.2 (g/mL) g Lab File ID: PHVAY05.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 1.9 Decanted: (Y/N) N Date Received: 07/23/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/25/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/27/2011

GPC Cleanup: (Y/N) Y pH: 8.6 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170	U
108-95-2	Phenol	170	U
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	170 ~~9.5~~ ~~J B~~ U B	
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	330	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	330	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 30.2 (g/mL) g Lab File ID: PHVAY05.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 1.9 Decanted: (Y/N) N Date Received: 07/23/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/25/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/27/2011

GPC Cleanup: (Y/N) Y pH: 8.6 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	330	U
100-02-7	4-Nitrophenol	330	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	330	U
534-52-1	4,6-Dinitro-2-methylphenol	330	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	330	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	17	J
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	170 ~~48~~	~~J B~~ UB
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 37.9 (g/mL) g Lab File ID: PHVAY08.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 07/23/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/25/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/27/2011

GPC Cleanup: (Y/N) Y pH: 9.3 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	140	U
100-52-7	Benzaldehyde	140	U
108-95-2	Phenol	140	U
111-44-4	Bis(2-chloroethyl)ether	140	U
95-57-8	2-Chlorophenol	140	U
95-48-7	2-Methylphenol	140	U
108-60-1	2,2'-Oxybis(1-chloropropane)	140	U
98-86-2	Acetophenone	14/L ~~8.2~~	~~J B~~ LC3
106-44-5	4-Methylphenol	140	U
621-64-7	N-Nitroso-di-n-propylamine	140	U
67-72-1	Hexachloroethane	140	U
98-95-3	Nitrobenzene	140	U
78-59-1	Isophorone	140	U
88-75-5	2-Nitrophenol	140	U
105-67-9	2,4-Dimethylphenol	140	U
111-91-1	Bis(2-chloroethoxy)methane	140	U
120-83-2	2,4-Dichlorophenol	140	U
91-20-3	Naphthalene	140	U
106-47-8	4-Chloroaniline	140	U
87-68-3	Hexachlorobutadiene	140	U
105-60-2	Caprolactam	140	U
59-50-7	4-Chloro-3-methylphenol	140	U
91-57-6	2-Methylnaphthalene	140	U
77-47-4	Hexachlorocyclopentadiene	140	U
88-06-2	2,4,6-Trichlorophenol	140	U
95-95-4	2,4,5-Trichlorophenol	140	U
92-52-4	1,1'-Biphenyl	140	U
91-58-7	2-Chloronaphthalene	140	U
88-74-4	2-Nitroaniline	260	U
131-11-3	Dimethylphthalate	140	U
606-20-2	2,6-Dinitrotoluene	140	U
208-96-8	Acenaphthylene	140	U
99-09-2	3-Nitroaniline	260	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 37.9 (g/mL) g Lab File ID: PHVAY08.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 07/23/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/25/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 07/27/2011

GPC Cleanup: (Y/N) Y pH: 9.3 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	140	U
51-28-5	2,4-Dinitrophenol	260	U
100-02-7	4-Nitrophenol	260	U
132-64-9	Dibenzofuran	140	U
121-14-2	2,4-Dinitrotoluene	140	U
84-66-2	Diethylphthalate	140	U
86-73-7	Fluorene	140	U
7005-72-3	4-Chlorophenyl-phenylether	140	U
100-01-6	4-Nitroaniline	260	U
534-52-1	4,6-Dinitro-2-methylphenol	260	U
86-30-6	N-Nitrosodiphenylamin [1]	140	U
95-94-3	1,2,4,5-Tetrachlorobenzene	140	U
101-55-3	4-Bromophenyl-phenylether	140	U
118-74-1	Hexachlorobenzene	140	U
1912-24-9	Atrazine	140	U
87-86-5	Pentachlorophenol	260	U
85-01-8	Phenanthrene	140	U
120-12-7	Anthracene	140	U
86-74-8	Carbazole	140	U
84-74-2	Di-n-butylphthalate	140	U
206-44-0	Fluoranthene	140	U
129-00-0	Pyrene	140	U
85-68-7	Butylbenzylphthalate	140	U
91-94-1	3,3'-Dichlorobenzidine	140	U
56-55-3	Benzo(a)anthracene	140	U
218-01-9	Chrysene	140	U
117-81-7	Bis(2-ethylhexyl)phthalate	140 ~~9.1~~	~~J B~~ U B
117-84-0	Di-n-octylphthalate	140	U
205-99-2	Benzo(b)fluoranthene	140	U
207-08-9	Benzo(k)fluoranthene	140	U
50-32-8	Benzo(a)pyrene	140	U
193-39-5	Indeno(1,2,3-cd)pyrene	140	U
53-70-3	Dibenzo(a,h)anthracene	140	U
191-24-2	Benzo(g,h,i)perylene	140	U
58-90-2	2,3,4,6-Tetrachlorophenol	140	U

[1] Cannot be separated from Diphenylamine

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 30.2 (g/mL) g Lab File ID: HLB08.D

Extraction: (Type) SONC

% Moisture: 1.9 Decanted: (Y/N) N Date Received: 07/23/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/25/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/03/2011

GPC Cleanup: (Y/N) Y pH: 8.6 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	3.3 ~~0.37~~	~~J B~~ UB
91-57-6	2-Methylnaphthalene	3.3	U
208-96-8	Acenaphthylene	3.3	U
83-32-9	Acenaphthene	3.3	U
86-73-7	Fluorene	3.3	U
118-74-1	Hexachlorobenzene	3.3	U
87-86-5	Pentachlorophenol	6.8	U
85-01-8	Phenanthrene	0.40	J
120-12-7	Anthracene	3.3	U
206-44-0	Fluoranthene	0.64	J
129-00-0	Pyrene	3.3 ~~2.1~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	0.39	J
218-01-9	Chrysene	0.52	J
205-99-2	Benzo(b)fluoranthene	0.68	J
207-08-9	Benzo(k)fluoranthene	0.64	J
50-32-8	Benzo(a)pyrene	4.4	~~B~~ UB
193-39-5	Indeno(1,2,3-cd)pyrene	0.41	J
53-70-3	Dibenz(a,h)anthracene	3.3	U
191-24-2	Benzo(g,h,i)perylene	1.1	J

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 37.9 (g/mL) g Lab File ID: HLB11.D

Extraction: (Type) SONC

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 07/23/2011

Concentrated Extract Volume: 500 (uL) Date Extracted: 07/25/2011

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/03/2011

GPC Cleanup: (Y/N) Y pH: 9.3 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	2.6 ~~0.27~~	~~J B~~ UB
91-57-6	2-Methylnaphthalene	2.6	U
208-96-8	Acenaphthylene	2.6	U
83-32-9	Acenaphthene	2.6	U
86-73-7	Fluorene	2.6	U
118-74-1	Hexachlorobenzene	2.6	U
87-86-5	Pentachlorophenol	5.3	U
85-01-8	Phenanthrene	2.6	U
120-12-7	Anthracene	2.6	U
206-44-0	Fluoranthene	0.31	J
129-00-0	Pyrene	2.6 ~~1.2~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	0.10	J
218-01-9	Chrysene	0.12	J
205-99-2	Benzo(b)fluoranthene	0.14	J
207-08-9	Benzo(k)fluoranthene	0.17	J
50-32-8	Benzo(a)pyrene	2.9	~~B~~ UB
193-39-5	Indeno(1,2,3-cd)pyrene	0.094	J
53-70-3	Dibenz(a,h)anthracene	2.6	U
191-24-2	Benzo(g,h,i)perylene	0.19	J

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 3.83 (g/mL) g Lab File ID: MHKA10.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/23/2011

% Moisture: not dec. 1.6 Date Analyzed: 07/28/2011

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
75-01-4	Vinyl chloride	6.6	U
75-35-4	1,1-Dichloroethene	6.6	U
75-09-2	Methylene chloride	6.6 ~~1.5~~	~~J B~~ UB
78-93-3	2-Butanone	13	U
67-66-3	Chloroform	6.6	U
56-23-5	Carbon tetrachloride	6.6	U
71-43-2	Benzene	6.6	U
107-06-2	1,2-Dichloroethane	6.6	U
79-01-6	Trichloroethene	6.6	U
108-88-3	Toluene	6.6 ~~0.16~~	~~J B~~ UB
127-18-4	Tetrachloroethene	6.6	U
108-90-7	Chlorobenzene	6.6	U
100-41-4	Ethylbenzene	6.6	U
541-73-1	1,3-Dichlorobenzene	6.6	U
106-46-7	1,4-Dichlorobenzene	6.6	U
95-50-1	1,2-Dichlorobenzene	6.6	U
120-82-1	1,2,4-Trichlorobenzene	6.6 ~~0.58~~	~~J B~~ UB
87-61-6	1,2,3-Trichlorobenzene	6.6 0.54	~~J B~~ ↓

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 5.32 (g/mL) g Lab File ID: MHKA13.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/23/2011

% Moisture: not dec. 0.50 Date Analyzed: 07/28/2011

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
75-01-4	Vinyl chloride	4.7	U
75-35-4	1,1-Dichloroethene	4.7	U
75-09-2	Methylene chloride	4.7 ~~0.82~~	~~J B~~ UB
78-93-3	2-Butanone	9.4	U
67-66-3	Chloroform	4.7	U
56-23-5	Carbon tetrachloride	4.7	U
71-43-2	Benzene	4.7	U
107-06-2	1,2-Dichloroethane	4.7	U
79-01-6	Trichloroethene	4.7	U
108-88-3	Toluene	4.7 ~~0.21~~	~~J B~~ UB
127-18-4	Tetrachloroethene	4.7	U
108-90-7	Chlorobenzene	4.7	U
100-41-4	Ethylbenzene	4.7	U
541-73-1	1,3-Dichlorobenzene	4.7	U
106-46-7	1,4-Dichlorobenzene	4.7	U
95-50-1	1,2-Dichlorobenzene	4.7	U
120-82-1	1,2,4-Trichlorobenzene	4.7 ~~0.30~~	~~J B~~ UB
87-61-6	1,2,3-Trichlorobenzene	4.7 ~~0.28~~	~~J B~~ UB

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-6164-4

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MHGD05.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/23/2011

% Moisture: not dec. Date Analyzed: 07/26/2011

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
75-01-4	Vinyl chloride	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	0.11	J
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	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
79-01-6	Trichloroethene	0.24	J B
108-88-3	Toluene	5.0	U
127-18-4	Tetrachloroethene	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	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
120-82-1	1,2,4-Trichlorobenzene	0.57	J B
87-61-6	1,2,3-Trichlorobenzene	0.52	J B

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 30.7 (g/mL) g Lab File ID: 02AUG111114-R031.D

% Moisture: 1.9 Decanted: (Y/N) N Date Received: 07/23/2011

Extraction: (Type) SONC Date Extracted: 07/25/2011

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 08/02/2011

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7 0.24 J P B (.13	
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-93-4	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7	U
5103-74-2	gamma-Chlordane	1.7	U
8001-35-2	Toxaphene	170	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 30.7 (g/mL) g Lab File ID: 27JUL111508-R031.D

% Moisture: 1.9 Decanted: (Y/N) N Date Received: 07/23/2011

Extraction: (Type) SONC Date Extracted: 07/25/2011

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/28/2011

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.6 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.3	U
789-02-6	2,4'-DDT	3.3	U
53-19-0	2,4'-DDD	3.3	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 38.3 (g/mL) g Lab File ID: 02AUG111114-R061.D

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 07/23/2011

Extraction: (Type) SONC Date Extracted: 07/25/2011

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 08/02/2011

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
319-84-6	alpha-BHC	1.3	U
319-85-7	beta-BHC	1.3 ~~0.51~~ ~~J P B~~ CB	
319-86-8	delta-BHC	1.3	U
58-89-9	gamma-BHC (Lindane)	1.3	U
76-44-8	Heptachlor	1.3	U
309-00-2	Aldrin	1.3	U
1024-57-3	Heptachlor epoxide	1.3	U
959-98-8	Endosulfan I	1.3	U
60-57-1	Dieldrin	2.6	U
72-55-9	4,4'-DDE	2.6	U
72-20-8	Endrin	2.6	U
33213-65-9	Endosulfan II	2.6	U
72-54-8	4,4'-DDD	2.6	U
1031-07-8	Endosulfan sulfate	2.6	U
50-29-3	4,4'-DDT	2.6	U
72-43-5	Methoxychlor	13	U
53494-70-5	Endrin ketone	2.6	U
7421-93-4	Endrin aldehyde	2.6	U
5103-71-9	alpha-Chlordane	1.3	U
5103-74-2	gamma-Chlordane	1.3	U
8001-35-2	Toxaphene	130	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 38.3 (g/mL) g Lab File ID: 27JUL111508-R041.D

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 07/23/2011

Extraction: (Type) SONC Date Extracted: 07/25/2011

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 07/28/2011

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.3 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	2.6	U
789-02-6	2,4'-DDT	2.6	U
53-19-0	2,4'-DDD	2.6	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-1

Sample wt/vol: 30.3 (g/mL) g Lab File ID: 29JUL111536-R031.D

% Moisture: 1.9 Decanted: (Y/N) N Date Received: 07/23/2011

Extraction: (Type) SONC Date Extracted: 07/25/2011

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 07/29/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.6 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	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
37324-23-5	Aroclor-1262	33	U
11100-14-4	Aroclor-1268	33	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-6164-2

Sample wt/vol: 38.7 (g/mL) g Lab File ID: 29JUL111536-R061.D

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 07/23/2011

Extraction: (Type) SONC Date Extracted: 07/25/2011

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 07/30/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 9.3 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	26	U
11104-28-2	Aroclor-1221	26	U
11141-16-5	Aroclor-1232	26	U
53469-21-9	Aroclor-1242	26	U
12672-29-6	Aroclor-1248	26	U
11097-69-1	Aroclor-1254	26	U
11096-82-5	Aroclor-1260	26	U
37324-23-5	Aroclor-1262	26	U
11100-14-4	Aroclor-1268	26	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-6164-2

SDG No.: PRR1141

Client Sample ID: PRR1SOLIF-01 | Lab Sample ID: 200-6164-1

Matrix: Solid | Lab File ID: 28jul111430-r031.d

Analysis Method: 8151A | Date Collected: 07/22/2011 11:00

Extraction Method: 8151A | Date Extracted: 07/27/2011 13:03

Sample wt/vol: 50.04(g) | Date Analyzed: 07/29/2011 00:30

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 1.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 22759 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	19	U	19	7.4
93-76-5	2,4,5-T	9.7	U	9.7	1.5
93-72-1	Silvex (2,4,5-TP)	3.9	U	3.9	0.46

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	83		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-6164-2

SDG No.: PRR1141

Client Sample ID: PRR1SOLIF-01 | Lab Sample ID: 200-6164-1

Matrix: Solid | Lab File ID: 28jul111430-r031.d

Analysis Method: 8151A | Date Collected: 07/22/2011 11:00

Extraction Method: 8151A | Date Extracted: 07/27/2011 13:03

Sample wt/vol: 50.04(g) | Date Analyzed: 07/29/2011 00:30

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: 1.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 22759 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	39	U	39	5.7

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	82		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-6164-2

SDG No.: PRR1141

Client Sample ID: PRR1SOLIF-02 | Lab Sample ID: 200-6164-2

Matrix: Solid | Lab File ID: 28jul111430-r061.d

Analysis Method: 8151A | Date Collected: 07/22/2011 11:15

Extraction Method: 8151A | Date Extracted: 07/27/2011 13:03

Sample wt/vol: 49.38(g) | Date Analyzed: 07/29/2011 01:39

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 0.3 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 22759 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	39	U	39	5.7
94-82-6	2,4-DB	19	U	19	7.4
93-76-5	2,4,5-T	9.6	U	9.6	1.5
93-72-1	Silvex (2,4,5-TP)	3.9	U	3.9	0.46

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	88		25-195

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141

Matrix: SOIL Lab Sample Id: 200-6164-1

% Solids: 98.1 Date Received: 07/23/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5660		~~D E~~	P
7440-38-2	Arsenic	1.2	J	D ~~N~~	P
7440-39-3	Barium	77.9		D ~~E N~~	P
7440-41-7	Beryllium	~~0.80~~	~~U~~	~~N~~	P
7440-43-9	Cadmium	0.11	J	~~D N~~	P
7440-70-2	Calcium	5560		~~D E~~	P
7440-47-3	Chromium	4.2		~~N E~~	P
7440-48-4	Cobalt	8.0		~~D E N~~	P
7440-50-8	Copper	14.5		~~D E * N~~	P
7439-89-6	Iron	20400		~~D E~~	P
7439-92-1	Lead	0.43	J	~~N~~	P
7439-95-4	Magnesium	4120		~~D E~~	P
7439-96-5	Manganese	204		~~D N~~	P
7440-02-0	Nickel	24.7		~~D E * N~~	P
7440-09-7	Potassium	2880		~~D E~~	P
7440-23-5	Sodium	26.0	J	D	P
7440-62-2	Vanadium	14.7		D ~~E N~~	P
7440-66-6	Zinc	38.6		~~D * N~~	P

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: CLOUDY Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141

Matrix: SOIL Lab Sample Id: 200-6164-1

% Solids: 98.1 Date Received: 07/23/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.0	U 5	~~N~~	MS
7782-49-2	Selenium	~~2.5~~	~~U~~ 1.5	~~N~~	MS
7440-22-4	Silver	~~0.50~~	~~U~~ 1.5	~~N~~	MS
7440-28-0	Thallium	0.5 ~~0.17~~	Y U[3]		MS

Color Before: BROWN Clarity Before: CLEAR Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts: ROCKS

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141

Matrix: SOIL Lab Sample Id: 200-6164-1

% Solids: 98.1 Date Received: 07/23/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.093	U		CV

Color Before: DARK BROWN Clarity Before: Texture: COARSE

Color After: LIGHT YELLOW Clarity After: CLOUDY Artifacts: ROCKS

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141

Matrix: SOIL Lab Sample Id: 200-6164-2

% Solids: 99.7 Date Received: 07/23/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1650		J E	P
7440-38-2	Arsenic	~~0.88~~	~~U~~	J R N	P
7440-39-3	Barium	12.1	J	E N	P
7440-41-7	Beryllium	~~0.44~~	~~U~~	J R N	P
7440-43-9	Cadmium	0.061	J	N	P
7440-70-2	Calcium	2040		J E	P
7440-47-3	Chromium	5.4		J N E	P
7440-48-4	Cobalt	2.1	J	E N	P
7440-50-8	Copper	2.2		J E * N	P
7439-89-6	Iron	4010		J E	P
7439-92-1	Lead	~~0.88~~	~~U~~	J R N	P
7439-95-4	Magnesium	1770		J E	P
7439-96-5	Manganese	55.0		J D N	P
7440-02-0	Nickel	4.3		J E * N	P
7440-09-7	Potassium	770		J E	P
7440-23-5	Sodium	107	J		P
7440-62-2	Vanadium	4.3	J	E N	P
7440-66-6	Zinc	6.2		J * N	P

Color Before: GRAY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: CLOUDY Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141

Matrix: SOIL Lab Sample Id: 200-6164-2

% Solids: 99.7 Date Received: 07/23/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.68	U	~~N~~	MS
7782-49-2	Selenium	~~1.7~~	~~U~~	~~N~~	MS
7440-22-4	Silver	~~0.34~~	U	~~N~~	MS
7440-28-0	Thallium	0.34 ~~0.062~~			MS

Color Before: GRAY Clarity Before: CLEAR Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts: ROCKS

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141
Matrix: SOIL Lab Sample Id: 200-6164-2
% Solids: 99.7 Date Received: 07/23/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.090	U		CV

Color Before: GRAY Clarity Before: Texture: COARSE
Color After: LIGHT YELLOW Clarity After: CLOUDY Artifacts: ROCKS
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLIF-01 Lab Sample ID: 200-6164-1

Lab Name: TestAmerica Burlington Job No.: 200-6164-2

SDG ID.: PRR1141

Matrix: Solid Date Sampled: 07/22/2011 11:00

Reporting Basis: WET Date Received: 07/23/2011 09:40

CAS No.	Analyte	Result	Units	C	Q	DIL	Method
	pH	8.39	SU		~~HF~~ J	1	9045C

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLIF-02 Lab Sample ID: 200-6164-2

Lab Name: TestAmerica Burlington Job No.: 200-6164-2

SDG ID.: PRR1141

Matrix: Solid Date Sampled: 07/22/2011 11:15

Reporting Basis: WET Date Received: 07/23/2011 09:40

CAS No.	Analyte	Result	Units	C	Q	DIL	Method
	pH	9.27	SU		HF J	1	9045C

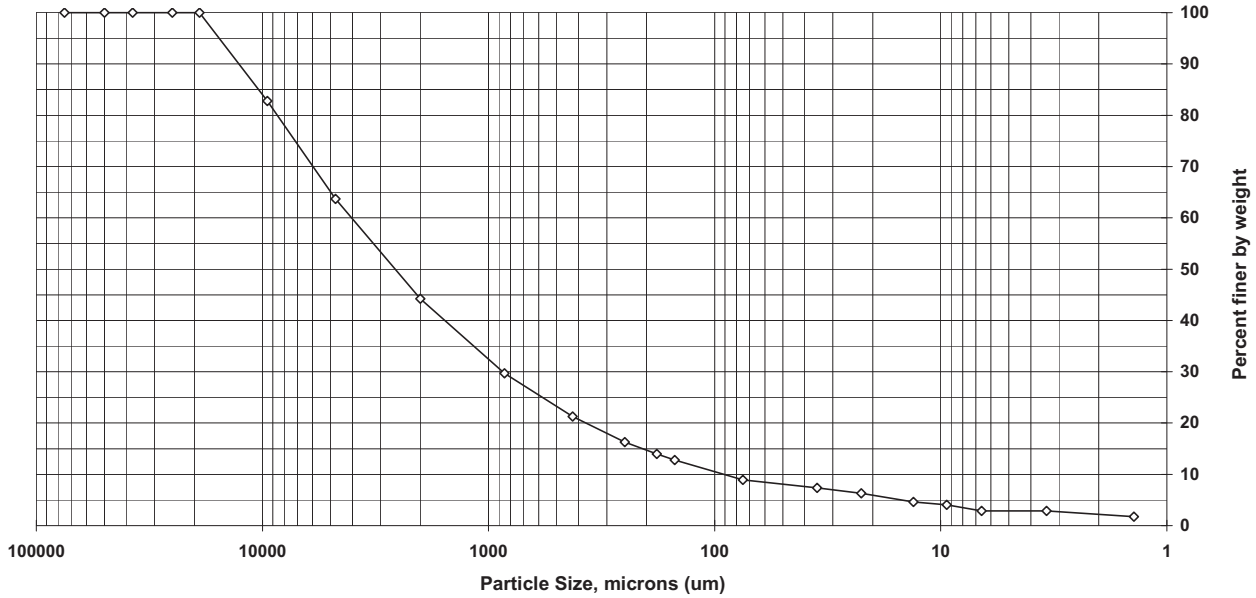
Particle Size of Soils by ASTM D422

				Date Received:	07/23/11
Sample ID:	PRR1SOLIF-01	**Percent Solids:**	97.6%	**Start Date:**	07/25/11
Lab ID:	200-6164-N-1	**Specific Gravity:**	2.650	**End Date:**	07/28/11

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	82.8	17.2
#4	4750	63.7	19.1
#10	2000	44.2	19.5
#20	850	29.7	14.5
#40	425	21.3	8.4
#60	250	16.3	5.0
#80	180	14.0	2.3
#100	150	12.8	1.2
#200	75	8.9	3.9
Hyd1	35.2	7.4	1.6
Hyd2	22.5	6.3	1.1
Hyd3	13.2	4.6	1.7
Hyd4	9.4	4.1	0.6
Hyd5	6.6	2.9	1.2
Hyd6	3.4	2.9	0.0
Hyd7	1.4	1.8	1.1

Soil Classification	Percent of sample
Gravel	36.3
Sand	54.8
Coarse Sand	19.5
Medium Sand	22.9
Fine Sand	12.4
Silt	6.1
Clay	2.9

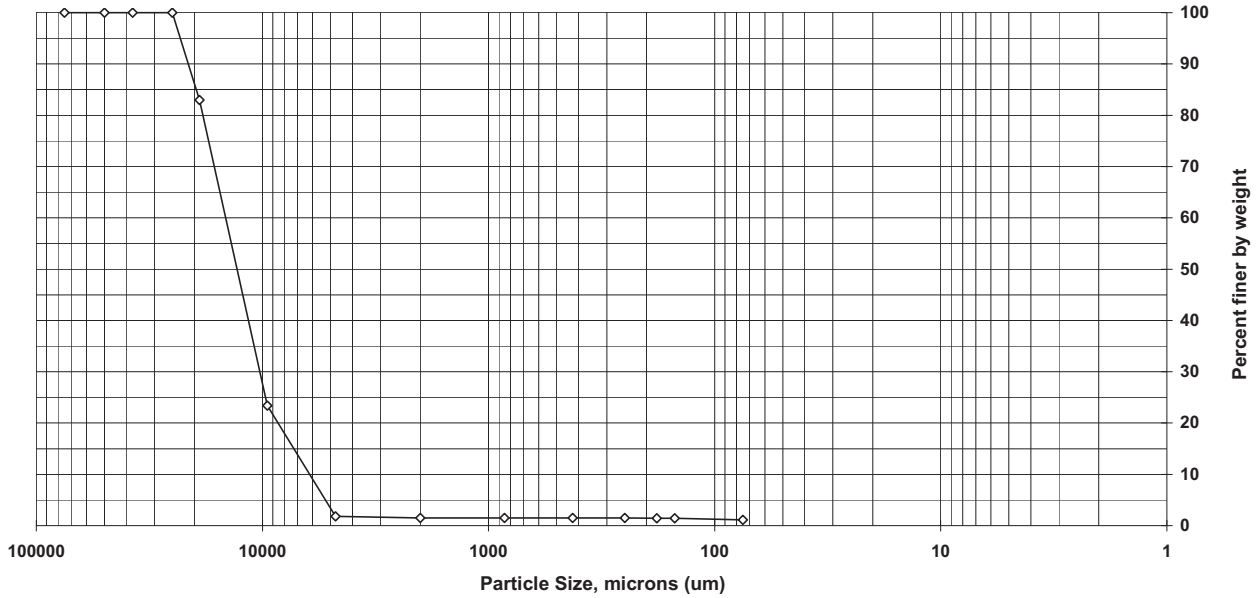
Particle Size of Soils by ASTM D422

				Date Received:	07/23/11
Sample ID:	PRR1SOLIF-02	**Percent Solids:**	99.8%	**Start Date:**	07/26/11
Lab ID:	200-6164-G-2	**Specific Gravity:**	2.650	**End Date:**	07/27/11

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	83.0	17.0
3/8 inch	9500	23.4	59.6
#4	4750	1.8	21.6
#10	2000	1.5	0.3
#20	850	1.5	0.0
#40	425	1.5	0.0
#60	250	1.5	0.0
#80	180	1.5	0.0
#100	150	1.4	0.0
#200	75	1.1	0.3

Soil Classification	Percent of sample
Gravel	98.2
Sand	0.7
Coarse Sand	0.3
Medium Sand	0.0
Fine Sand	0.4
Fines	1.1

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Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Removal Action Work Plan Quality Assurance Project Plan	PRR1141	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1SOLIF-01	7/22/2011	11:00	Soil	Composite	24	X	X	X	X	X	X	X	X													MS/MSD
PRR1SOLIF-02	7/22/2011	11:15	Soil	Composite	7	X	X	X	X	X	X	X	X													
PRR1SOLIF-03	7/22/2011	11:30	Grab	Composite	3																					
TB07222011-01	7/22/2011		Water		3		X																			

Requested Analyses	
1	SVOCs
2	VOCs
3	Arsenic (As)
4	Metals
5	Chlorinated Herbicides
6	Pesticides
7	pH
8	Grain Size
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Special Instructions/Comments:

Please hold sample analysis for PRR1SOLIF-03 until further direction from ARCADIS

5-day turnaround

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Test America - Burlington, VT

Shipping Tracking #: 797331471827, 797331471849

Specify Turnaround Requirements: 5-day

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt

Condition/Cooler Temp

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	7/22/2011	1800	7/23 940	JK 7/23/11			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1141A (200-6218)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #14599R VAL
Project: B0009966.0002.70006

SUMMARY

This data quality validation report summarizes the review of Sample Delivery Group (SDG) #PRR1141A (200-6218) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOPs; USEPA National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010); and EPA Region 2 Data Validation SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation and validation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1SOLIF-03	200-6218-2	Soil	7/22/2011		X	X	X	X	X

Miscellaneous parameters include Chlorinated Herbicides by SW846 8151A and pH
SPLP Volatiles, SPLP Semivolatiles, SPLP Pesticides, SPLP Aroclor PCBs by USEPA 1312/SOM0.1.2.
SPLP Metals by USEPA 1312/ISM01.2
SPLP Chlorinated herbicides by USEPA 1312/8151A
pH by USEPA modified 9045C

The sample was received by the laboratory on 7/23/2011 and put on hold. The lab was instructed to take the sample off hold and to analyze for SPLP volatiles, semivolatiles, pesticides, aroclor PCBs, chlorinated herbicides, metals and pH.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of diethylphthalate, di-n-butyl phthalate, butyl benzyl phthalate, and bis(2-ethylhexyl) phthalate. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

All analytes 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
PRR1SOLIF-03	Diethylphthalate Di-n-butyl phthalate Butyl benzyl phthalate Bis(2-ethylhexyl) phthalate	<PQL[1]	Detected sample results <PQL	UB at the PQL

PQL = 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 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 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 compounds associated with the calibrations were within the specified control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance 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)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS determinations were performed on sample PRR1SOLIF-03 for semivolatile analysis. All recoveries were observed within acceptable limits with the exception of two compounds.

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

Sample Locations	Compound	MS Recovery
PRR1SOLIF-03	4-Nitrophenol	>UL
	2,4-Dinitrotoluene	>UL

The criteria used to evaluate the MS recoveries are presented in the following table. In the case of an MS 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

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

SEMIVOLATILE SIM DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of naphthalene, pyrene, and benzo(a)pyrene. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

All analytes 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
PRR1SOLIF-03	Naphthalene Pyrene Benzo(a)pyrene	<PQL	Detected sample results <PQL	UB at the PQL

PQL = reporting limit is equal to the low point of the initial calibration curve.

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 compounds associated with the calibrations were within the specified control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance 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)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS determinations were performed on sample PRR1SOLIF-03 for semivolatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

VOLATILE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

Accuracy/Bias- Methylene chloride was detected at a significant concentration in the sample. This compound was detected in the SPLP method blank, holding blank and instrument method blank at concentrations less than the PQL. The laboratory initiated a review of the data. It was determined that the sample may have been contaminated in the laboratory when a graduated cylinder from the extractions lab was used for measuring and transferring the SPLP leachate. Methylene chloride is routinely used in an extraction laboratory.

Minor

Accuracy/Bias -The SPLP method blank exhibited low level concentrations of methylene chloride, trichloroethene, toluene, and 1,2,4-trichlorobenzene. 2-Butanone was detected at a concentration greater than the PQL. Methylene chloride, 2-butanone, and toluene were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. The other compounds were not detected in the sample.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. 2-Butanone was observed in the SPLP associated method blank above the project quantitation limits (PQL) during volatile analysis.

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
PRR1SOLIF-03	Toluene	<PQL[1]	Detected sample results <PQL	UB at the PQL
	2-Butanone	>PQL[1]	Detected sample results >PQL and < blank concentration	UB at detected sample concentration
	Methylene chloride	<RL[1]	Detected sample results >RL	JX See below

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

Methylene chloride was detected at a significant concentration in the sample. This compound was detected in the SPLP method blank, holding blank and instrument method blank at concentrations less than the PQL. The laboratory initiated a review of the data. It was determined that the sample may have been contaminated in the laboratory when a graduated cylinder from the extractions lab was used for measuring and transferring the SPLP leachate. Methylene chloride is routinely used in an extraction laboratory. Since the sample result is much greater than the associated method blanks, but laboratory contamination is suspected, the methylene chloride sample result is flagged JX.

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 calibration criteria were within the control limits.

5. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance 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 areas and retention times were within established limits.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS determinations were performed on sample PRR1SOLIF-03 for volatile analysis. All recoveries were observed within acceptable limits.

8. 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.

9. REPORTING

This SDG does not contain re-extraction, or re-analysis. The sample was diluted for methylene chloride. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

PESTICIDE and 2,4-DDX SERIES DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of alpha-BHC, beta-BHC, delta-BHC and gamma-chlordane. These compounds were detected in the sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

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
PRR1SOLIF-03	alpha-BHC beta-BHC delta-BHC gamma-Chlordane	<PQL	Detected sample results <PQL	UB at the PQL

PQL Practical Quantitation 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

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS determinations were performed on sample PRR1SOLIF-03 for pesticide analysis. All recoveries were observed within acceptable limits.

7. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

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. 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 did not meet %D criteria for alpha BHC, beta-BHC, delta-BHC, and gamma-Chlordane. The sample results were revised to non-detect due to method blank contamination. Therefore, no qualification is required for the dual column analysis.

10. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

11. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

12. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide analysis is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

13. Overall Assessment

Overall 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.

AROCLOR PCB DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis.

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

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS determinations were performed on sample PRR1SOLIF-03 for PCB analysis. All recoveries were observed within acceptable limits.

7. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

8. 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%.

Aroclor PCBs were not detected in the samples.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for Aroclor analysis is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

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 is allowed.

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

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

6. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

7. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS determinations were performed on sample PRR1SOLIF-03 for herbicide analysis. All recoveries were observed within acceptable limits.

8. 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 40%.

Herbicides were not detected in the samples.

9. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

10. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

11. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for herbicide analyses is greater than 40 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

12. Overall Assessment

Overall 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.

TOTAL METALS DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The matrix spike recovery was less than the lower acceptance limit for antimony, indicating potential low bias for the affected analyte in the associated sample. Project accuracy measurement performance criteria were not met for the affected analytes.

Accuracy/Bias - The method blank exhibited low level concentration of potassium, zinc, antimony and thallium. These analytes were detected in the sample at a concentration less than five times the method blank concentration, except for potassium. Therefore, zinc, antimony and thallium concentrations in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

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	Analyte	Blank Result	Sample Result	Qualification
PRR1SOLIF-03	Zinc Antimony Thallium	<PQL	Detected sample results <PQL	UB at the PQL
	Potassium	<PQL	Detected sample results >PQL	No Action

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 continuing calibration verification standard recoveries were within the control limit.

3.2 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

5. MATRIX SPIKE (MS)

A MS is generated to determine the accuracy of the analytical procedure in a given matrix.

Sample PRR1SOLIF-03 was selected for MS analysis. The result of this evaluation was that all elements had observed spike recoveries within limits (75-125%) with the following exceptions. The observed recovery for antimony did not meet accuracy acceptance criteria, indicating potential low bias in the associated sample. Project accuracy/bias measurement performance criteria were not met for antimony.

Matrix spike recoveries and validation qualification are described in the following tables.

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
PRR1SOLIF-03	Antimony	51%

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
PRR1SOLIF-03	Antimony	51%	98%

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

6. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on the sample due to limited leachate volume.

7. SERIAL DILUTION

Sample PRR1SOLIF-03 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all elements met method measurement performance criteria.

8. REPORTING

The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

11. Overall Assessment

Overall 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.

pH DATA VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

There is no EPA specified holding time for a deionized water leaching procedure of soil for pH. The sample was tumbled in deionized water 11 days from collection. The pH measurement of the leachate was performed within the QAPP specified hold time of 48 hours. Accuracy/bias cannot be determined.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, pH was successfully measured during each of the LCS determinations.

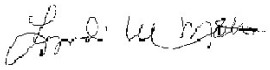
3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1SOLIF-03 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for pH met project measurement performance criteria.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: August 26, 2011

PEER REVIEW BY: Dennis Capria

DATE: September 6, 2011

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - PCBs

ANALYTE		PRR1SOLIF-03	LQ	VQ
Aroclor-1016	ug/L	1	U	U
Aroclor-1221	ug/L	1	U	U
Aroclor-1232	ug/L	1	U	U
Aroclor-1242	ug/L	1	U	U
Aroclor-1248	ug/L	1	U	U
Aroclor-1254	ug/L	1	U	U
Aroclor-1260	ug/L	1	U	U
Aroclor-1262	ug/L	1	U	U
Aroclor-1268	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - Pesticides

ANALYTE		PRR1SOLIF-03	LQ	VQ
2,4'-DDD	ug/L	0.1	U	U
2,4'-DDE	ug/L	0.1	U	U
2,4'-DDT	ug/L	0.1	U	U
4,4'-DDD	ug/L	0.1	U	U
4,4'-DDE	ug/L	0.1	U	U
4,4'-DDT	ug/L	0.1	U	U
Aldrin	ug/L	0.05	U	U
Alpha-BHC	ug/L	0.05	J P B	UB
Alpha-Chlordane	ug/L	0.05	U	U
Beta-BHC	ug/L	0.05	J P B	UB
Delta-BHC	ug/L	0.05	J P B	UB
Dieldrin	ug/L	0.1	U	U
Endosulfan I	ug/L	0.05	U	U
Endosulfan II	ug/L	0.1	U	U
Endosulfan Sulfate	ug/L	0.1	U	U
Endrin	ug/L	0.1	U	U
Endrin Aldehyde	ug/L	0.1	U	U
Endrin Ketone	ug/L	0.1	U	U
Gamma-BHC (Lindane)	ug/L	0.05	U	U
Gamma-Chlordane	ug/L	0.05	J P B	UB
Heptachlor	ug/L	0.05	U	U
Heptachlor Epoxide	ug/L	0.05	U	U
Methoxychlor	ug/L	0.5	U	U
Toxaphene	ug/L	5	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - VOCs

ANALYTE		PRR1SOLIF-03	LQ	VQ
1,1-Dichloroethene	ug/L	5	U	U
1,2,3-Trichlorobenzene	ug/L	5	U	U
1,2,4-Trichlorobenzene	ug/L	5	U	U
1,2-Dichlorobenzene	ug/L	5	U	U
1,2-Dichloroethane	ug/L	5	U	U
1,3-Dichlorobenzene	ug/L	5	U	U
1,4-Dichlorobenzene	ug/L	5	U	U
2-Butanone	ug/L	13	B	UB
Benzene	ug/L	5	U	U
Carbon Tetrachloride	ug/L	5	U	U
Chlorobenzene	ug/L	5	U	U
Chloroform	ug/L	5	U	U
Ethylbenzene	ug/L	5	U	U
Methylene Chloride	ug/L	370	B X	DJX
Tetrachloroethene	ug/L	5	U	U
Toluene	ug/L	5	J B	UB
Trichloroethene	ug/L	5	U	U
Vinyl Chloride	ug/L	5	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - SVOCs

ANALYTE		PRR1SOLIF-03	LQ	VQ
1,1'-Biphenyl	ug/L	25	U	U
1,2,4,5-Tetrachlorobenzene	ug/L	25	U	U
2,2'-Oxybis(1-Chloropropane)	ug/L	25	U	U
2,3,4,6-Tetrachlorophenol	ug/L	25	U	U
2,4,5-Trichlorophenol	ug/L	25	U	U
2,4,6-Trichlorophenol	ug/L	25	U	U
2,4-Dichlorophenol	ug/L	25	U	U
2,4-Dimethylphenol	ug/L	1	J	J
2,4-Dinitrophenol	ug/L	50	U	U
2,4-Dinitrotoluene	ug/L	25	U	U
2,6-Dinitrotoluene	ug/L	25	U	U
2-Chloronaphthalene	ug/L	25	U	U
2-Chlorophenol	ug/L	25	U	U
2-Methylnaphthalene	ug/L	25	U	U
2-Methylphenol	ug/L	25	U	U
2-Nitroaniline	ug/L	50	U	U
2-Nitrophenol	ug/L	25	U	U
3,3'-Dichlorobenzidine	ug/L	25	U	U
3-Nitroaniline	ug/L	50	U	U
4,6-Dinitro-2-methylphenol	ug/L	50	U	U
4-Bromophenyl-phenylether	ug/L	25	U	U
4-Chloro-3-Methylphenol	ug/L	25	U	U
4-Chloroaniline	ug/L	25	U	U
4-Chlorophenyl-phenylether	ug/L	25	U	U
4-Methylphenol	ug/L	25	U	U
4-Nitroaniline	ug/L	50	U	U
4-Nitrophenol	ug/L	50	U	U
Acenaphthene	ug/L	25	U	U
Acenaphthylene	ug/L	25	U	U
Acetophenone	ug/L	25	U	U
Anthracene	ug/L	25	U	U
Atrazine	ug/L	25	U	U
Benzaldehyde	ug/L	25	U	U
Benzo(a)anthracene	ug/L	25	U	U
Benzo(a)pyrene	ug/L	25	U	U
Benzo(b)fluoranthene	ug/L	25	U	U
Benzo(g,h,i)perylene	ug/L	25	U	U
Benzo(k)fluoranthene	ug/L	25	U	U
bis(2-Chloroethoxy)methane	ug/L	25	U	U
bis(2-Chloroethyl)ether	ug/L	25	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - SVOCs

ANALYTE		PRR1SOLIF-03	LQ	VQ
bis(2-Ethylhexyl)phthalate	ug/L	25	J B	UB
Butylbenzylphthalate	ug/L	25	J B	UB
Caprolactam	ug/L	25	U	U
Carbazole	ug/L	25	U	U
Chrysene	ug/L	25	U	U
Dibenzo(a,h)anthracene	ug/L	25	U	U
Dibenzofuran	ug/L	25	U	U
Diethylphthalate	ug/L	25	J B	UB
Dimethylphthalate	ug/L	25	U	U
Di-n-Butylphthalate	ug/L	25	J B	UB
Di-n-Octylphthalate	ug/L	25	U	U
Fluoranthene	ug/L	25	U	U
Fluorene	ug/L	25	U	U
Hexachlorobenzene	ug/L	25	U	U
Hexachlorobutadiene	ug/L	25	U	U
Hexachlorocyclopentadiene	ug/L	25	U	U
Hexachloroethane	ug/L	25	U	U
Indeno(1,2,3-cd)pyrene	ug/L	25	U	U
Isophorone	ug/L	25	U	U
Naphthalene	ug/L	25	U	U
Nitrobenzene	ug/L	25	U	U
N-Nitroso-di-n-propylamine	ug/L	25	U	U
N-Nitrosodiphenylamine	ug/L	25	U	U
Pentachlorophenol	ug/L	50	U	U
Phenanthrene	ug/L	25	U	U
Phenol	ug/L	25	U	U
Pyrene	ug/L	25	U	U
Pyridine	ug/L	25	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - SVOCs - SIM

ANALYTE		PRR1SOLIF-03	LQ	VQ
2-Methylnaphthalene	ug/L	0.5	U	U
Acenaphthene	ug/L	0.5	U	U
Acenaphthylene	ug/L	0.5	U	U
Anthracene	ug/L	0.5	U	U
Benzo(a)anthracene	ug/L	0.5	U	U
Benzo(a)pyrene	ug/L	0.5	J B	UB
Benzo(b)fluoranthene	ug/L	0.5	U	U
Benzo(g,h,i)perylene	ug/L	0.5	U	U
Benzo(k)fluoranthene	ug/L	0.5	U	U
Chrysene	ug/L	0.5	U	U
Dibenzo(a,h)anthracene	ug/L	0.5	U	U
Fluoranthene	ug/L	0.5	U	U
Fluorene	ug/L	0.5	U	U
Hexachlorobenzene	ug/L	0.5	U	U
Indeno(1,2,3-cd)pyrene	ug/L	0.5	U	U
Naphthalene	ug/L	0.5	J B	UB
Pentachlorophenol	ug/L	1	U	U
Phenanthrene	ug/L	0.5	U	U
Pyrene	ug/L	0.5	J B	UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - Inorganics

ANALYTE		PRR1SOLIF-03	LQ	VQ
Aluminum	ug/L	97.7	J	J
Antimony	ug/L	2	J N	JBJ
Arsenic	ug/L	10	U	U
Barium	ug/L	200	U	U
Beryllium	ug/L	5	U	U
Cadmium	ug/L	5	U	U
Calcium	ug/L	2,740	J	J
Chromium	ug/L	10	U	U
Cobalt	ug/L	50	U	U
Copper	ug/L	25	U	U
Iron	ug/L	100	U	U
Lead	ug/L	10	U	U
Magnesium	ug/L	5,000	U	U
Manganese	ug/L	4.8	J	J
Mercury	ug/L	0.2	U	U
Nickel	ug/L	40	U	U
Potassium	ug/L	1,380	J	J
Selenium	ug/L	5	U	U
Silver	ug/L	1	U	U
Sodium	ug/L	865	J	J
Thallium	ug/L	1	J	UB
Vanadium	ug/L	50	U	U
Zinc	ug/L	60	J	UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - Herbicides

ANALYTE		PRR1SOLIF-03	LQ	VQ
2,4,5-T	ug/L	0.47	U	U
2,4,5-TP	ug/L	0.19	U	U
2,4-D	ug/L	1.9	U	U
2,4-DB	ug/L	1.7	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1141A - Miscellaneous

ANALYTE		PRR1SOLIF-03	LQ	VQ
pH	SU	9.33		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MHGI10.D

Level: (TRACE/LOW/MED) LOW Date Received: 08/03/2011

% Moisture: not dec. Date Analyzed: 08/04/2011

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
75-01-4	Vinyl chloride	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	370 ~~360~~	~~E B X~~ DJX
78-93-3	2-Butanone	13	~~J~~ UB
67-66-3	Chloroform	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
79-01-6	Trichloroethene	5.0	U
108-88-3	Toluene	5.0 ~~0.46~~	~~J B~~ UB
127-18-4	Tetrachloroethene	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	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
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MHGI09.D

Level: (TRACE/LOW/MED) LOW Date Received: 08/03/2011

% Moisture: not dec. Date Analyzed: 08/04/2011

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 2.9

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
75-01-4	Vinyl chloride	15	U
75-35-4	1,1-Dichloroethene	15	U
75-09-2	Methylene chloride	370	B X
78-93-3	2-Butanone	16	J B
67-66-3	Chloroform	15	U
56-23-5	Carbon tetrachloride	15	U
71-43-2	Benzene	15	U
107-06-2	1,2-Dichloroethane	15	U
79-01-6	Trichloroethene	15	U
108-88-3	Toluene	0.52	J B
127-18-4	Tetrachloroethene	15	U
108-90-7	Chlorobenzene	15	U
100-41-4	Ethylbenzene	15	U
541-73-1	1,3-Dichlorobenzene	15	U
106-46-7	1,4-Dichlorobenzene	15	U
95-50-1	1,2-Dichlorobenzene	15	U
120-82-1	1,2,4-Trichlorobenzene	15	U
87-61-6	1,2,3-Trichlorobenzene	15	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 200 (g/mL) mL Lab File ID: RJE10.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 08/03/2011

Concentrated Extract Volume: 1000 (uL) Date Extracted: 08/03/2011

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 08/08/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
110-86-1	Pyridine	25	U
100-52-7	Benzaldehyde	25	U
108-95-2	Phenol	25	U
111-44-4	Bis(2-chloroethyl)ether	25	U
95-57-8	2-Chlorophenol	25	U
95-48-7	2-Methylphenol	25	U
108-60-1	2,2'-Oxybis(1-chloropropane)	25	U
98-86-2	Acetophenone	25	U
106-44-5	4-Methylphenol	25	U
621-64-7	N-Nitroso-di-n-propylamine	25	U
67-72-1	Hexachloroethane	25	U
98-95-3	Nitrobenzene	25	U
78-59-1	Isophorone	25	U
88-75-5	2-Nitrophenol	25	U
105-67-9	2,4-Dimethylphenol	1.0	J
111-91-1	Bis(2-chloroethoxy)methane	25	U
120-83-2	2,4-Dichlorophenol	25	U
91-20-3	Naphthalene	25	U
106-47-8	4-Chloroaniline	25	U
87-68-3	Hexachlorobutadiene	25	U
105-60-2	Caprolactam	25	U
59-50-7	4-Chloro-3-methylphenol	25	U
91-57-6	2-Methylnaphthalene	25	U
77-47-4	Hexachlorocyclopentadiene	25	U
88-06-2	2,4,6-Trichlorophenol	25	U
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	25	U
91-58-7	2-Chloronaphthalene	25	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethylphthalate	25	U
606-20-2	2,6-Dinitrotoluene	25	U
208-96-8	Acenaphthylene	25	U
99-09-2	3-Nitroaniline	50	U

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 200 (g/mL) mL Lab File ID: RJE10.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 08/03/2011

Concentrated Extract Volume: 1000 (uL) Date Extracted: 08/03/2011

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 08/08/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
83-32-9	Acenaphthene	25	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	25	U
121-14-2	2,4-Dinitrotoluene	25	U
84-66-2	Diethylphthalate	25 ~~0.68~~	~~J B~~ UB
86-73-7	Fluorene	25	U
7005-72-3	4-Chlorophenyl-phenylether	25	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamin[1]	25	U
95-94-3	1,2,4,5-Tetrachlorobenzene	25	U
101-55-3	4-Bromophenyl-phenylether	25	U
118-74-1	Hexachlorobenzene	25	U
1912-24-9	Atrazine	25	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	25	U
120-12-7	Anthracene	25	U
86-74-8	Carbazole	25	U
84-74-2	Di-n-butylphthalate	25 ~~1.4~~	~~J B~~ UB
206-44-0	Fluoranthene	25	U
129-00-0	Pyrene	25	U
85-68-7	Butylbenzylphthalate	25 ~~2.2~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	25	U
56-55-3	Benzo(a)anthracene	25	U
218-01-9	Chrysene	25	U
117-81-7	Bis(2-ethylhexyl)phthalate	25 ~~2.8~~	~~J B~~ UB
117-84-0	Di-n-octylphthalate	25	U
205-99-2	Benzo(b)fluoranthene	25	U
207-08-9	Benzo(k)fluoranthene	25	U
50-32-8	Benzo(a)pyrene	25	U
193-39-5	Indeno(1,2,3-cd)pyrene	25	U
53-70-3	Dibenzo(a,h)anthracene	25	U
191-24-2	Benzo(g,h,i)perylene	25	U
58-90-2	2,3,4,6-Tetrachlorophenol	25	U

[1]Cannot be separated from Diphenylamine

1F - FORM I SV-SIM
SEMIVOLATILE SIM ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 200 (g/mL) mL Lab File ID: HLBGQ03.D

Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 08/03/2011

Concentrated Extract Volume: 1000 (uL) Date Extracted: 08/03/2011

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 08/04/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
91-20-3	Naphthalene	0.50 ~~0.074~~	~~J B~~ UB
91-57-6	2-Methylnaphthalene	0.50	U
208-96-8	Acenaphthylene	0.50	U
83-32-9	Acenaphthene	0.50	U
86-73-7	Fluorene	0.50	U
118-74-1	Hexachlorobenzene	0.50	U
87-86-5	Pentachlorophenol	1.0	U
85-01-8	Phenanthrene	0.50	U
120-12-7	Anthracene	0.50	U
206-44-0	Fluoranthene	0.50	U
129-00-0	Pyrene	0.50 ~~0.20~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	0.50	U
218-01-9	Chrysene	0.50	U
205-99-2	Benzo(b)fluoranthene	0.50	U
207-08-9	Benzo(k)fluoranthene	0.50	U
50-32-8	Benzo(a)pyrene	0.50 ~~0.49~~	~~J B~~ UB
193-39-5	Indeno(1,2,3-cd)pyrene	0.50	U
53-70-3	Dibenz(a,h)anthracene	0.50	U
191-24-2	Benzo(g,h,i)perylene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 04AUG111214-R051.D

% Moisture: Decanted: (Y/N) Date Received: 08/03/2011

Extraction: (Type) SEPF Date Extracted: 08/03/2011

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/04/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.05 ~~0.00060~~	~~J P B~~ UB
319-85-7	beta-BHC	~~0.011~~	~~J P B~~
319-86-8	delta-BHC	~~0.0010~~	~~J P B~~
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.05 ~~0.0016~~	~~J P B~~ UB
8001-35-2	Toxaphene	5.0	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 04AUG111421-R031.D

% Moisture: Decanted: (Y/N) Date Received: 08/03/2011

Extraction: (Type) SEPF Date Extracted: 08/03/2011

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/04/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.10	U
789-02-6	2,4'-DDT	0.10	U
53-19-0	2,4'-DDD	0.10	U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1141A

Matrix: (SOIL/SED/WATER) Leachate Lab Sample ID: 200-6218-2

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 04AUG111626-R031.D

% Moisture: Decanted: (Y/N) Date Received: 08/03/2011

Extraction: (Type) SEPF Date Extracted: 08/03/2011

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/05/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
37324-23-5	Aroclor-1262	1.0	U
11100-14-4	Aroclor-1268	1.0	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-6218-2

SDG No.: PRR1141A

Client Sample ID: PRR1SOLIF-03 | Lab Sample ID: 200-6218-2

Matrix: Leachate | Lab File ID: 06aug111026-r031.d

Analysis Method: 8151A | Date Collected: 08/03/2011 08:45

Extraction Method: 8151A | Date Extracted: 08/03/2011 11:07

Sample wt/vol: 1000(mL) | Date Analyzed: 08/06/2011 19:10

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 23237 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.7	U	1.7	0.47
93-76-5	2,4,5-T	0.47	U	0.47	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	101		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-6218-2

SDG No.: PRR1141A

Client Sample ID: PRR1SOLIF-03 Lab Sample ID: 200-6218-2

Matrix: Leachate Lab File ID: 06aug111026-r031.d

Analysis Method: 8151A Date Collected: 08/03/2011 08:45

Extraction Method: 8151A Date Extracted: 08/03/2011 11:07

Sample wt/vol: 1000(mL) Date Analyzed: 08/06/2011 19:10

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 23237 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.9	U	1.9	0.65
93-72-1	Silvex (2,4,5-TP)	0.19	U	0.19	0.028

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	98		60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141A
Matrix: LEACHATE Lab Sample Id: 200-6218-2
% Solids: Date Received: 08/03/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	97.7	J		P
7440-38-2	Arsenic	10.0	U		P
7440-39-3	Barium	200	U		P
7440-41-7	Beryllium	5.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	2740	J		P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	50.0	U		P
7440-50-8	Copper	25.0	U		P
7439-89-6	Iron	100	U		P
7439-92-1	Lead	10.0	U		P
7439-95-4	Magnesium	5000	U		P
7439-96-5	Manganese	4.8	J		P
7440-02-0	Nickel	40.0	U		P
7440-09-7	Potassium	1380	J		P
7440-23-5	Sodium	865	J		P
7440-62-2	Vanadium	50.0	U		P
7440-66-6	Zinc	60 ~~2.5~~	U	UB	P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141A
Matrix: LEACHATE Lab Sample Id: 200-6218-2
% Solids: Date Received: 08/03/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.0 ~~0.17~~	I	UBJX	MS
7782-49-2	Selenium	5.0	U		MS
7440-22-4	Silver	1.0	U		MS
7440-28-0	Thallium	1.0 ~~0.35~~	I	UB	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLIF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1141A
Matrix: LEACHATE Lab Sample Id: 200-6218-2
% Solids: Date Received: 08/03/2011

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLIF-03 Lab Sample ID: 200-6218-1

Lab Name: TestAmerica Burlington Job No.: 200-6218-2

SDG ID.: PRR1141A

Matrix: Solid Date Sampled: 07/22/2011 11:30

Reporting Basis: WET Date Received: 07/23/2011 09:40

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.33			SU			1	9045C

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Removal Action Work Plan Quality Assurance Project Plan	PRR1141	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1SOLIF-01	7/22/2011	11:00	Soil	Composite	24	X	X	X	X	X	X	X	X													MS/MSD
PRR1SOLIF-02	7/22/2011	11:15	Soil	Composite	7	X	X	X	X	X	X	X	X													
PRR1SOLIF-03	7/22/2011	11:30	Grab	Composite	3																					
TB07222011-01	7/22/2011		Water		3		X																			

Requested Analyses	
1	SVOCs
2	VOCs
3	Aroclor PCBs
4	Metals
5	Chlorinated Herbicides
6	Pesticides
7	pH
8	Grain Size
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Special Instructions/Comments:

Please hold sample analysis for PRR1SOLIF-03 until further direction from ARCADIS

5-day turnaround

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Test America - Burlington, VT

Shipping Tracking # 797331471827, 797331471849

Specify Turnaround Requirements: 5-day

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	7/22/2011	1800					
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

Young, Kirk

From: Shatt, Ryan [Ryan.Shatt@arcadis-us.com]
Sent: Wednesday, July 27, 2011 1:52 PM
To: Young, Kirk
Cc: Callahan, Christopher; Dusablon, Kris; Rosner, Nicholas J; Cicero, William; Dustin, Jack
Subject: RE: SPLP analysis

Kirk – the 14 day turnaround time that you had indicated is fine.

Thanks

From: Young, Kirk [mailto:Kirk.Young@testamericainc.com]
Sent: Wednesday, July 27, 2011 10:42 AM
To: Shatt, Ryan
Cc: Callahan, Christopher; Dusablon, Kris; Rosner, Nicholas J; Cicero, William; Dustin, Jack
Subject: RE: SPLP analysis
Importance: High

Ryan,

We will proceed with the analytical work. I will need to know what the expectations are for reporting analytical results to Arcadis in summary form. As I had indicated, it will take ~20 hours to generate the SPLP and another ~20 hours to provide for the semivolatile extractions.

Kirk

KIRK YOUNG
Project Technical Director

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

30 Community Drive, Suite 11
South Burlington, VT 05403
Tel 802.660.1990 Direct 802.923.1017
www.testamericainc.com

From: Shatt, Ryan [mailto:Ryan.Shatt@arcadis-us.com]
Sent: Wednesday, July 27, 2011 1:35 PM
To: Young, Kirk
Subject: SPLP analysis

Hi Kirk-

ARCADIS authorizes Test America to analyze sample PRR1SOLIF-03 using SPLP Method 1312. As discussed, the only deviation to the method would be no size reduction of the sample (2-inch stone).

1.) The extract will be analyzed for the following analytes (using methods consistent with the RAWP QAPP):

- VOCs
- SVOCs

- Aroclor PCBs
- Metals
- Herbicides
- Pesticides

2.) A separate sample of the extract (1 L preferred) will need to be sent to Vista Analytical for analysis of dioxins.

3.) As discussed a separate 4-hour tumble will be conducted using DI water for pH analysis.

4.) No MS/MSD will be required for this sample.

5.) ARCADIS is aware that due to the size of the stone, SPLP for VOCs cannot be conduct with zero headspace. Please proceed with this analysis.

6.) Proceed with the reduced extraction volume (200 mL) for the SVOC analysis.

7.) To be consistent with the RAWP QAPP, utilize SIM to achieve the required detection limits for select SVOCs.

Thanks

Privileged and Confidential Work Product
Prepared at the Request of Legal Counsel
for or in Anticipation of Litigation
and in Connection with Rendering Legal Advice

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www.arcadis-us.com

Registered Geologist/ WA | PA
Registered Hydrogeologist/ WA

ARCADIS, Imagine the result

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TIERRA SOLUTIONS, INC. – Waste Characterization QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

TCLP Volatile, Semivolatile, Pesticide, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# WC01 (200-6938)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #14801R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #WC01 (200-6938) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services SOPs; USEPA National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010); and EPA Region 2 Data Validation SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST	MET	MISC
PRR1WC-CS01	200-6938-01	Soil	9/09/2011		X	X	X	X	X
PRR1WC-CS02	200-6938-02	Soil	9/09/2011		X	X	X	X	X

Miscellaneous parameters include TCLP Chlorinated Herbicides by SW846 1311/8151A, and Paint Filter Test by SW846 9095A.
TCLP Volatiles, TCLP Semivolatiles, TCLP Pesticides, by SW846 1311 and USEPA SOM0.1.2.
TCLP Metals by SW846 1311 and USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

TCLP SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The surrogate, 4-methylphenol exhibited a recovery slightly above the upper control limit for sample location PRR1WC-CS02. The associated compounds were not detected in the sample. Therefore there is no affect on the data.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the samples in this sample delivery group were performed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WC-CS02	Phenol-d5	AC
	Bis(2-chloroethyl)ether-d8	AC
	2-Chlorophenol-d4	AC
	4-Methylphenol-d8	> UL
	Nitrobenzene-d5	AC

Sample Locations	Surrogate	Recovery
PRR1WC-CS02	2-Nitrophenol-d4	AC
	2,4-Dichlorophenol-d3	AC
	4-Chloroaniline-d4	AC
	Dimethylphthalate-d6	AC
	Acenapthylene-d8	AC
	4-Nitrophenol-d4	AC
	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

The compounds associated with the surrogate deviation were non-detect. Therefore no action was required.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS01 for semivolatile analysis. All recoveries were observed within acceptable limits.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits, corrected for TCLP fluid volume, met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

9. Overall Assessment

Overall 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.

TCLP VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of 2-butanone, which was detected in a sample at concentrations less than five times the method blank concentration. Therefore, 2-butanone in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

The method blank exhibited a concentration greater than the MDL and less than the PQL for 2-butanone. This compound was detected in sample location PRR1WC-CS02 at concentration less than five times the method blank concentration; therefore, 2-butanone in the sample is most likely from laboratory contamination. The sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WC-CS01	Vinyl chloride-d3	AC
	Chloroethane-d5	AC
	1.1-Dichloroethene-d2	AC
	2-Butanone-d5	> UL
	Chloroform-d	AC
	1,2-Dichloroethane-d4	AC
	Benzene-d6	AC
	1,2-Dichloropropane	AC
	Toluene-d8	AC
	trans-1,3-Dichloropopene-d4	AC
	2-Hexanone-d5	> UL
	1,4-Dioxane-d8	AC
	1,1,2,2-Tetrachloroethane-d2	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 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

The compounds associated with the surrogate deviation were non-detect. Therefore, no action was required.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS01 for volatile analysis. All recoveries were observed within acceptable limits.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

9. Overall Assessment

Overall 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.

TCLP PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

When dual column analysis is performed, the percent difference (%D) of detected sample results must less than 25%. Many compounds were flagged “P” by the laboratory indicating the %D exceeded 25%.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS01 for pesticide analysis. All

recoveries were observed within acceptable limits.

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

Compound Identification

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
PRR1WC-CS01	gamma-BHC	173.5%
	Heptachlor epoxide	55.3%
PRR1WC-CS02	gamma-BHC	167.2%
	Heptachlor	168.3%
	Heptachlor epoxide	145.7%
	Endrin	533.4%
	Methoxychlor	78.0%

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 non-detect.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

10. Overall Assessment

Overall 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.

TCLP CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of 2,4-D and Silvex (2,4,5-TP), which was also detected in a samples. See Section 2 for details.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

The method blank exhibited a concentration greater than the MDL and less than the PQL for 2,4-D and Silvex (2,4,5-TP). 2,4-D was detected in sample location PRR1WC-CS02 at concentration less than five times the method blank concentration; therefore, 2,4-D in this sample is most likely from laboratory contamination. The sample result for 2,4-D is reported at the PQL and flagged UB indicating non-detect due to blank contamination for sample location PRR1WC-CS-02. Other sample results associated with QA blank contamination that were greater than the five times the method blank concentration resulted in the removal of the laboratory qualifier (B) of data

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS01 for herbicide analysis. All recoveries were observed within acceptable limits.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

Compound Identification

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
PRR1WC-CS01	Silvex (2,4,5-TP)	157.0%
PRR1WC-CS02	2,4-D	193.2%
	Silvex (2,4,5-TP)	77.3%

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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for herbicide analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

10. Overall Assessment

Overall 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.

TCLP METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The matrix spike recoveries were less than the control limit for silver, indicating potential low bias for positive and non-detect results for the affected analytes in the associated samples. Project accuracy measurement performance criteria were not met for the affected analyte.

Accuracy/Bias - The method blank exhibited low level concentration of arsenic. This analyte was detected in the sample at a concentration less than five times the method blank concentration; therefore, arsenic in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

The method blank exhibited a concentration greater than the MDL and less than the PQL for arsenic. This analyte was detected in sample location PRR1WC-CS02 at concentration less than five times the method blank concentration; therefore, arsenic in the sample is most likely from laboratory contamination. The sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of

samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

Sample PRR1WC-CS01 was selected for MS analysis. The result of this evaluation was that silver had spike recovery less than the control limit (61%), which is below the control limit of (75-125%). Silver results did not meet accuracy acceptance criteria and were qualified N by the laboratory, indicating potential low bias in associated samples. Project accuracy/bias measurement performance criteria were not met. The silver results are qualified as estimated with UJ.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WC-CS01 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

Chromium was reported from a diluted analysis for sample location PRR1WC-CS-01 and are flagged D by the laboratory.

The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

FREE LIQUID DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

A holding time is not specified for free liquids.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

An LCS is not required for free liquids.

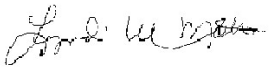
3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location associated with this SDG.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: October 18, 2011

PEER REVIEW: Dennis Capria

DATE: October 18, 2011

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC01 - Pesticides

ANALYTE		PRR1WC-CS01	LQ	VQ	PRR1WC-CS02	LQ	VQ
Endrin	ug/L	0.095	U	U	0.095	JP	U
Gamma-BHC (Lindane)	ug/L	0.048	JP	U	0.066	P	JN
Heptachlor	ug/L	0.048	U	U	0.048	JP	U
Heptachlor Epoxide	ug/L	0.048	JP	U	0.048	JP	U
Methoxychlor	ug/L	0.48	U	U	0.48	JP	U
Technical Chlordane	ug/L	0.48	U	U	0.48	U	U
Toxaphene	ug/L	4.8	U	U	4.8	U	U

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC01- VOCs

ANALYTE		PRR1WC-CS01	LQ	VQ	PRR1WC-CS02	LQ	VQ
1,1-Dichloroethene	ug/L	5	U	U	5	U	U
1,2-Dichloroethane	ug/L	5	U	U	5	U	U
1,4-Dichlorobenzene	ug/L	5	U	U	5	U	U
2-Butanone	ug/L	10	U	U	10	JB	UB
Benzene	ug/L	5	U	U	5	U	U
Carbon Tetrachloride	ug/L	5	U	U	5	U	U
Chlorobenzene	ug/L	5	U	U	6.3		
Chloroform	ug/L	5	U	U	5	U	U
Tetrachloroethene	ug/L	5	U	U	5	U	U
Trichloroethene	ug/L	5	U	U	5	U	U
Vinyl Chloride	ug/L	5	U	U	5	U	U

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC01 - SVOCs

ANALYTE		PRR1WC-CS01	LQ	VQ	PRR1WC-CS02	LQ	VQ
2,4,5-Trichlorophenol	ug/L	25	U	U	25	U	U
2,4,6-Trichlorophenol	ug/L	25	U	U	25	U	U
2,4-Dinitrotoluene	ug/L	25	U	U	25	U	U
2-Methylphenol	ug/L	25	U	U	25	U	U
4-Methylphenol	ug/L	25	U	U	25	U	U
Cresol	ug/L	25	U	U	25	U	U
Hexachlorobutadiene	ug/L	25	U	U	25	U	U
Hexachloroethane	ug/L	25	U	U	25	U	U
Nitrobenzene	ug/L	25	U	U	25	U	U
Pentachlorophenol	ug/L	2.7	J	J	50	U	U
Pyridine	ug/L	25	U	U	7.9	J	J

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC01 - Inorganics

ANALYTE		PRR1WC-CS01	LQ	VQ	PRR1WC-CS02	LQ	VQ
Arsenic	ug/L	10	U	U	10	J	UB
Barium	ug/L	155	J	J	287		
Cadmium	ug/L	1	J	J	1	J	J
Chromium	ug/L	7830	D		34.4		
Lead	ug/L	2.6	J	J	14.3		
Mercury	ug/L	0.097	J	J	0.2	U	U
Selenium	ug/L	7.3	J	J	35	U	U
Silver	ug/L	10 U N		UJ	10 U N		UJ

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC01 - Herbicides

ANALYTE		PRR1WC-CS01	LQ	VQ	PRR1WC-CS02	LQ	VQ
2,4,5-TP	ug/L	0.18	JpB	U	0.18	JpB	U
2,4-D	ug/L	1.4	B		0.47	JpB	UB

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC01 - Miscellaneous

ANALYTE		PRR1WC-CS01	LQ	VQ	PRR1WC-CS02	LQ	VQ
Free Liquid	mL/100g	Absent	Absent		Absent	Absent	

SAMPLE ANALYSIS DATA SHEETS AND COCs

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

SOM01.2/VOA Low/Medium Volatiles-TCLP

Analysis Method:	SOM01.2/VOA	Analysis Batch:	200-25624	Instrument ID:	M.i
Prep Method:	SOM01.2/VOA_PR	Prep Batch:	N/A	Lab File ID:	mhta09.d
Dilution:	1.0	Leach Batch:	200-25428	Initial Weight/Volume:	5 mL
Analysis Date:	09/21/2011 1220			Final Weight/Volume:	5 mL
Prep Date:	09/21/2011 1220				
Leach Date:	09/19/2011 1107				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
Vinyl chloride		5.0	U	5.0
1,1-Dichloroethene		5.0	U	5.0
2-Butanone		10	U	10
Chloroform		5.0	U	5.0
Carbon tetrachloride		5.0	U	5.0
Benzene		5.0	U	5.0
1,2-Dichloroethane		5.0	U	5.0
Trichloroethene		5.0	U	5.0
Tetrachloroethene		5.0	U	5.0
Chlorobenzene		5.0	U	5.0
1,4-Dichlorobenzene		5.0	U	5.0

Surrogate	%Rec	Qualifier	Acceptance Limits
Vinyl chloride-d3	105		65 - 131
Chloroethane-d5	108		71 - 131
1,1-Dichloroethene-d2	72		55 - 104
2-Butanone-d5	156	*	49 - 155
Chloroform-d	89		78 - 121
1,2-Dichloroethane-d4	93		78 - 129
Benzene-d6	89		77 - 124
1,2-Dichloropropane-d6	86		79 - 124
Toluene-d8	89		77 - 121
trans-1,3-Dichloropropene-d4	94		73 - 121
2-Hexanone-d5	188	*	28 - 135
1,4-Dioxane-d8	95		50 - 150
1,1,2,2-Tetrachloroethane-d2	91		73 - 125
1,2-Dichlorobenzene-d4	91		80 - 131

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

SOM01.2/VOA Low/Medium Volatiles-TCLP

Analysis Method:	SOM01.2/VOA	Analysis Batch:	200-25624	Instrument ID:	M.i
Prep Method:	SOM01.2/VOA_PR	Prep Batch:	N/A	Lab File ID:	mhta08.d
Dilution:	1.0	Leach Batch:	200-25428	Initial Weight/Volume:	5 mL
Analysis Date:	09/21/2011 1152			Final Weight/Volume:	5 mL
Prep Date:	09/21/2011 1152				
Leach Date:	09/19/2011 1107				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
Vinyl chloride		5.0	U	5.0
1,1-Dichloroethene		5.0	U	5.0
2-Butanone		~~3.7~~ 10	~~J B~~ UB	10
Chloroform		5.0	U	5.0
Carbon tetrachloride		5.0	U	5.0
Benzene		5.0	U	5.0
1,2-Dichloroethane		5.0	U	5.0
Trichloroethene		5.0	U	5.0
Tetrachloroethene		5.0	U	5.0
Chlorobenzene		6.3		5.0
1,4-Dichlorobenzene		5.0	U	5.0

Surrogate	%Rec	Qualifier	Acceptance Limits
Vinyl chloride-d3	102		65 - 131
Chloroethane-d5	101		71 - 131
1,1-Dichloroethene-d2	70		55 - 104
2-Butanone-d5	92		49 - 155
Chloroform-d	88		78 - 121
1,2-Dichloroethane-d4	91		78 - 129
Benzene-d6	86		77 - 124
1,2-Dichloropropane-d6	83		79 - 124
Toluene-d8	86		77 - 121
trans-1,3-Dichloropropene-d4	92		73 - 121
2-Hexanone-d5	107		28 - 135
1,4-Dioxane-d8	102		50 - 150
1,1,2,2-Tetrachloroethane-d2	88		73 - 125
1,2-Dichlorobenzene-d4	89		80 - 131

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

SOM01.2/SV Semivolatiles-TCLP

Analysis Method:	SOM01.2/SV	Analysis Batch:	200-25620	Instrument ID:	R.i
Prep Method:	SOM01.2SV_CLLE	Prep Batch:	200-25303	Lab File ID:	rjhzd07.d
Dilution:	1.0	Leach Batch:	200-25203	Initial Weight/Volume:	200 mL
Analysis Date:	09/21/2011 1113			Final Weight/Volume:	1000 uL
Prep Date:	09/15/2011 1947			Injection Volume:	2 uL
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
Pyridine		25	U	25
2-Methylphenol		25	U	25
4-Methylphenol		25	U	25
Hexachloroethane		25	U	25
Nitrobenzene		25	U	25
Hexachlorobutadiene		25	U	25
2,4,6-Trichlorophenol		25	U	25
2,4,5-Trichlorophenol		25	U	25
2,4-Dinitrotoluene		25	U	25
Pentachlorophenol		2.7	J	50
Total Cresols		25	U	25

Surrogate	%Rec	Qualifier	Acceptance Limits
Phenol-d5	79		39 - 106
Bis(2-chloroethyl)ether-d8	73		40 - 105
2-Chlorophenol-d4	75		41 - 106
4-Methylphenol-d8	102		25 - 111
Nitrobenzene-d5	81		43 - 108
2-Nitrophenol-d4	82		40 - 108
2,4-Dichlorophenol-d3	84		37 - 105
4-Chloroaniline-d4	74		1 - 145
Dimethylphthalate-d6	78		47 - 114
Acenaphthylene-d8	81		41 - 107
4-Nitrophenol-d4	61		33 - 116
Fluorene-d10	71		42 - 111
4,6-Dinitro-2-methylphenol-d2	93		22 - 104
Anthracene-d10	84		44 - 110
Pyrene-d10	91		52 - 119
Benzo(a)pyrene-d12	80		32 - 121

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

SOM01.2/SV Semivolatiles-TCLP

Analysis Method:	SOM01.2/SV	Analysis Batch:	200-25620	Instrument ID:	R.i
Prep Method:	SOM01.2SV_CLLE	Prep Batch:	200-25303	Lab File ID:	rjhzd10.d
Dilution:	1.0	Leach Batch:	200-25203	Initial Weight/Volume:	200 mL
Analysis Date:	09/21/2011 1301			Final Weight/Volume:	1000 uL
Prep Date:	09/15/2011 1947			Injection Volume:	2 uL
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
Pyridine		7.9	J	25
2-Methylphenol		25	U	25
4-Methylphenol		25	U	25
Hexachloroethane		25	U	25
Nitrobenzene		25	U	25
Hexachlorobutadiene		25	U	25
2,4,6-Trichlorophenol		25	U	25
2,4,5-Trichlorophenol		25	U	25
2,4-Dinitrotoluene		25	U	25
Pentachlorophenol		50	U	50
Total Cresols		25	U	25

Surrogate	%Rec	Qualifier	Acceptance Limits
Phenol-d5	80		39 - 106
Bis(2-chloroethyl)ether-d8	78		40 - 105
2-Chlorophenol-d4	78		41 - 106
4-Methylphenol-d8	112	*	25 - 111
Nitrobenzene-d5	86		43 - 108
2-Nitrophenol-d4	88		40 - 108
2,4-Dichlorophenol-d3	92		37 - 105
4-Chloroaniline-d4	98		1 - 145
Dimethylphthalate-d6	86		47 - 114
Acenaphthylene-d8	89		41 - 107
4-Nitrophenol-d4	63		33 - 116
Fluorene-d10	79		42 - 111
4,6-Dinitro-2-methylphenol-d2	76		22 - 104
Anthracene-d10	94		44 - 110
Pyrene-d10	100		52 - 119
Benzo(a)pyrene-d12	91		32 - 121

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

SOM01.2/Pest Pesticides-TCLP

Analysis Method:	SOM01.2/Pest	Analysis Batch:	200-25770	Instrument ID:	0911.i
Prep Method:	SOM01.2Pes_SFE	Prep Batch:	200-25305	Initial Weight/Volume:	1050 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/17/2011 0057			Injection Volume:	1 uL
Prep Date:	09/15/2011 2038			Result Type:	PRIMARY
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
gamma-BHC (Lindane)		~~0.031~~ 0.048	JP U	0.048
Heptachlor		0.048	U	0.048
Heptachlor epoxide		~~0.013~~ 0.048	JP U	0.048
Endrin		0.095	U	0.095
Methoxychlor		0.48	U	0.48
Toxaphene		4.8	U	4.8
Chlordane (technical)		0.48	U	0.48

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	116		30 - 150
Tetrachloro-m-xylene	111		30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

SOM01.2/Pest Pesticides-TCLP

Analysis Method:	SOM01.2/Pest	Analysis Batch:	200-25770	Instrument ID:	0911.i
Prep Method:	SOM01.2Pes_SFE	Prep Batch:	200-25305	Initial Weight/Volume:	1050 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/17/2011 0254			Injection Volume:	1 uL
Prep Date:	09/15/2011 2038			Result Type:	PRIMARY
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
gamma-BHC (Lindane)		0.066	P 3N	0.048
Heptachlor		~~0.018~~ 0.048	XPU	0.048
Heptachlor epoxide		~~0.012~~ 0.048	XPU	0.048
Endrin		~~0.0024~~ 0.095	XPU	0.095
Methoxychlor		~~0.0048~~ 0.48	XPU	0.48
Toxaphene		4.8	U	4.8
Chlordane (technical)		0.48	U	0.48

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	105		30 - 150
Tetrachloro-m-xylene	108		30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

SOM01.2/Pest Pesticides-TCLP

Analysis Method:	SOM01.2/Pest	Analysis Batch:	200-25770	Instrument ID:	0911.i
Prep Method:	SOM01.2Pes_SFE	Prep Batch:	200-25305	Initial Weight/Volume:	1050 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/17/2011 0254			Injection Volume:	1 uL
Prep Date:	09/15/2011 2038			Result Type:	SECONDARY
Leach Date:	09/14/2011 1730				

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	108		30 - 150
Tetrachloro-m-xylene	109		30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-6938-2
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	200-25592	Instrument ID:	5005.i
Prep Method:	8151A	Prep Batch:	200-25324	Initial Weight/Volume:	1050 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/20/2011 1701			Injection Volume:	1 uL
Prep Date:	09/16/2011 0913			Result Type:	PRIMARY
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
2,4-D		1.4	~~B~~	0.012	0.46
Silvex (2,4,5-TP)		~~0.10~~ 0.15	~~J~~ J	0.00053	0.18

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	102		60 - 130

Client: ARCADIS U.S. Inc

Job Number: 200-6938-2
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	200-25592	Instrument ID:	5005.i
Prep Method:	8151A	Prep Batch:	200-25324	Initial Weight/Volume:	1050 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/20/2011 1701			Injection Volume:	1 uL
Prep Date:	09/16/2011 0913			Result Type:	SECONDARY
Leach Date:	09/14/2011 1730				

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	101		60 - 130

Client: ARCADIS U.S. Inc

Job Number: 200-6938-2
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	200-25592	Instrument ID:	5005.i
Prep Method:	8151A	Prep Batch:	200-25324	Initial Weight/Volume:	1030 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/20/2011 1839			Injection Volume:	1 uL
Prep Date:	09/16/2011 0913			Result Type:	PRIMARY
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
2,4-D		~~0.19~~ 0.47	~~JpB~~ U [2]	0.013	0.47
Silvex (2,4,5-TP)		~~0.098~~ 0.18	~~JpB~~ U	0.00054	0.18

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	108		60 - 130

Client: ARCADIS U.S. Inc

Job Number: 200-6938-2
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	200-25592	Instrument ID:	5005.i
Prep Method:	8151A	Prep Batch:	200-25324	Initial Weight/Volume:	1030 mL
Dilution:	1.0	Leach Batch:	200-25203	Final Weight/Volume:	10000 uL
Analysis Date:	09/20/2011 1839			Injection Volume:	1 uL
Prep Date:	09/16/2011 0913			Result Type:	SECONDARY
Leach Date:	09/14/2011 1730				

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	102		60 - 130

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

ISM01.2/HG ISM01.2 Mercury-TCLP

Analysis Method:	ISM01.2/HG	Analysis Batch:	200-25527	Instrument ID:	MEPCV3 II
Prep Method:	ISM01.2/HG	Prep Batch:	200-25418	Lab File ID:	092011BB.PRN
Dilution:	1.0	Leach Batch:	200-25203	Initial Weight/Volume:	50 mL
Analysis Date:	09/20/2011 1502			Final Weight/Volume:	50 mL
Prep Date:	09/19/2011 0930				
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDLE	RL
Mercury		0.097	J	0.084	0.20

ISM01.2/ICP ISM01.2 Metals (ICP)-TCLP

Analysis Method:	ISM01.2/ICP	Analysis Batch:	200-25458	Instrument ID:	METICP7
Prep Method:	ISM01.2/ICP	Prep Batch:	200-25330	Lab File ID:	091611-05.ttx
Dilution:	1.0	Leach Batch:	200-25203	Initial Weight/Volume:	100 mL
Analysis Date:	09/17/2011 0645			Final Weight/Volume:	100 mL
Prep Date:	09/16/2011 0830				
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
Arsenic		10.0	U	2.9	10.0
Barium		155	J	13.0	200
Cadmium		1.0	J	0.63	5.0
Lead		2.6	J	2.3	10.0
Selenium		7.3	J	4.5	35.0
Silver		10.0	U N S	1.6	10.0

Analysis Method:	ISM01.2/ICP	Analysis Batch:	200-25526	Instrument ID:	METICP7
Prep Method:	ISM01.2/ICP	Prep Batch:	200-25330	Lab File ID:	091911-05.ttx
Dilution:	50	Leach Batch:	200-25203	Initial Weight/Volume:	100 mL
Analysis Date:	09/19/2011 2047	Run Type:	DL	Final Weight/Volume:	100 mL
Prep Date:	09/16/2011 0830				
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
Chromium		7830	D	24.5	500

Client: ARCADIS U.S. Inc

Job Number: 200-6938-1
Sdg Number: WC01

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

ISM01.2/HG ISM01.2 Mercury-TCLP

Analysis Method:	ISM01.2/HG	Analysis Batch:	200-25527	Instrument ID:	MEPCV3 II
Prep Method:	ISM01.2/HG	Prep Batch:	200-25418	Lab File ID:	092011BB.PRN
Dilution:	1.0	Leach Batch:	200-25203	Initial Weight/Volume:	50 mL
Analysis Date:	09/20/2011 1508			Final Weight/Volume:	50 mL
Prep Date:	09/19/2011 0955				
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDLE	RL
Mercury		0.20	U	0.084	0.20

ISM01.2/ICP ISM01.2 Metals (ICP)-TCLP

Analysis Method:	ISM01.2/ICP	Analysis Batch:	200-25458	Instrument ID:	METICP7
Prep Method:	ISM01.2/ICP	Prep Batch:	200-25330	Lab File ID:	091611-05.ttx
Dilution:	1.0	Leach Batch:	200-25203	Initial Weight/Volume:	100 mL
Analysis Date:	09/17/2011 0718			Final Weight/Volume:	100 mL
Prep Date:	09/16/2011 0830				
Leach Date:	09/14/2011 1730				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
Arsenic		~~5.5~~ 10 UB J		2.9	10.0
Barium		287		13.0	200
Cadmium		1.0	J	0.63	5.0
Chromium		34.4		0.49	10.0
Lead		14.3		2.3	10.0
Selenium		35.0	U	4.5	35.0
Silver		10.0	U N J	1.6	10.0

General Chemistry

Client Sample ID: **PRR1WC-CS01**

Lab Sample ID: 200-6938-1
Client Matrix: Solid

Date Sampled: 09/09/2011 1130
Date Received: 09/10/2011 1000

Analyte	Result	Qual	Units	Dil	Method
Free Liquid	Absent		mL/100g	1.0	9095A

Analysis Batch: 200-25077 Analysis Date: 09/12/2011 1815 DryWt Corrected: N

General Chemistry

Client Sample ID: **PRR1WC-CS02**

Lab Sample ID: 200-6938-2
Client Matrix: Solid

Date Sampled: 09/09/2011 1145
Date Received: 09/10/2011 1000

Analyte	Result	Qual	Units	Dil	Method
Free Liquid	Absent		mL/100g	1.0	9095A

Analysis Batch: 200-25077 Analysis Date: 09/12/2011 1815 DryWt Corrected: N

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Waste Characterization Quality Assurance Project Plan - Phase 1 Removal Action	WC01	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1WCCS-01	9/9/2011	11:30	Soil	Composite	14	X	X	X	X	X	X															MS/MSD (Note No MS/MSD for Paint Filter Test)
PRR1WCCS-02	9/9/2011	11:45	Soil	Composite	6	X	X	X	X	X	X															

Requested Analyses	
1	TCLP VOCs
2	TCLP SVOCs
3	TCLP Pesticides
4	TCLP Chlorinated Herbicides
5	TCLP Metals
6	Paint Filter Test
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
18	
20	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Test America - Burlington, VT

Shipping Tracking #

☐ Cooler packed with Ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.5, 3.2°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	9/9/2011	1800					
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

Young, Kirk

From: Gandhi, Kavin [Kavin.Gandhi@arcadis-us.com]
Sent: Saturday, September 10, 2011 10:47 AM
To: Young, Kirk
Cc: Shatt, Ryan
Subject: Tierra - Waste Characterization QAPP Sampling
Attachments: TA_Burlington_SDG WC01.pdf; TA_Burlington_COC-WC01_090911.pdf

Kirk,
As part of the Passaic River RA Waste Characterization QAPP (WCQAPP), we collected 2 waste characterization soil samples and shipped to Test America Burlington.
The following 2 samples were collected:

- PRR1WC-CS01
- PRR1WC-CS02

Please find attached the SDG (WC01) and the COCs for these samples.

One other thing to **NOTE** is that, it appears that the hyphen in the Sample Ids may not be right and we were wondering if you can correct this when you log the samples so that there is no future discrepancy with data. In the SDG and COCs, I have the sample Ids as PRR1WCCS-01 but they should actually be PRR1WC-CS01. The hyphen needs to precede "CS" and not "01'. Can you please make this change while logging both the samples. The Sample IDs should be

- PRR1WC-CS01
- PRR1WC-CS02

The samples were delivered this morning.

Let us know if you have any questions.
Thanks,
Kavin.

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Infrastructure · Water · Environment · Buildings

Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Miscellaneous Analyses

SDG# PRR1142 (460-32202)

Analyses Performed By:
TestAmerica Laboratories
Edison, New Jersey

Report: #14943R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1142 (460-32202) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with ARCADIS SOP V-13 which is applicable to the analytical method associated with this SDG and USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATTDF-01	460-32202-1	Water	10/10/2011						X

Note:

1. Miscellaneous parameters include total suspended solids (TSS)

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

TOTAL SUSPENDED SOLIDS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on the sample in this sample delivery group.

4. REPORTING

This SDG does not contain re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

5. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

6. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

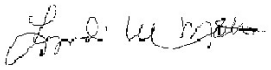
Qualifier	Description
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

7. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: October 26, 2011

PEER REVIEW: Joseph C. Houser

DATE: November 4, 2011

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR1142 - Miscellaneous

ANALYTE		PRR1WATTDF-01	LQ	VQ
Total Suspended Solids	mg/L	168		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Removal Action Work Plan Quality Assuran

TestAmerica Job ID: 460-32202-1

Client Sample ID: PRR1WATTDF-01
Date Collected: 10/10/11 12:35
Date Received: 10/10/11 14:10

Lab Sample ID: 460-32202-1
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	168		40.0	40.0	mg/L			10/11/11 07:32	1

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

32202

10/12/2011

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Removal Action Work Plan Quality Assurance Project Plan	PRR1142	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1WATTDF-01	10/10	12:35	Water	Grab	1	X																				

Requested Analyses	
1	TSS
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Special Instructions/Comments:

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmer

Shipping Tracking #

Specify Turnaround Requirements: 48 hr

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
[signature]	10/10/11	14:10	[signature]				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

5.3° #50

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1143 (33420)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #15028R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1143 (33420) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOP V-7 "Verification Validation PCDD/PCDFs", Revision 0, January 2009, and EPA Region 2 SOP HW-25, Rev. 3 "Validating Tetra- through Octa-chlorinated Dioxins and Furans by Isotope Dilution (HRGC/HRMS) Method 1613.

This report contains the results of the data verification and validation including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCDD/ PCDF	MET	MISC
PRR1GWUPF-01	33420-001	Water	10/19/2011				X		

PCDD/PCDFs – USEPA 1613

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentration of OCDD. This compound was detected in the sample at a concentration greater than five times the method blank concentration; therefore, detected sample results were not associated with blank contamination.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

The method blank exhibited concentrations less than the PQL for OCDD. This compound was detected in the sample at a concentration greater than five times the method blank concentration; therefore, detected sample results were not associated with blank contamination. Sample results associated with method blank contamination resulted in the removal of the laboratory qualifier (B) of data.

3. CHROMATOGRAPHIC RESOLUTION

A performance check solution (Window Defining Mixture/Isomer Specificity Test Standard) was analyzed at the beginning of every 12-hour analysis period (DB-5 column only). Upon evaluation of the performance check solution data, all QC criteria were met. Therefore, the data associated with these check standards were not qualified.

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 relative standard deviation (RSD) of 20% is allowed for all non-labeled compounds (target) and 30% is allowed for all labeled compounds (internal standards and recovery standards).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibited percent difference (%D) less than the control limit (20%).

All calibration criteria were within the control limits.

5. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

6. INTERNAL STANDARD PERFORMANCE

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds exhibit recoveries within the control limits of 40% to 135%.

All internal standard areas and retention times were within established limits.

7. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

8. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in the sample. Confirmation analysis was performed and 2,3,7,8-TCDF was detected at a concentration similar to the initial sample analysis.

9. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

An MS and MSD were performed on sample PRR1GWUPF-01 for PCDD/PCDF analysis. Upon evaluation, precision and accuracy indicators were favorable in all cases.

10. Reporting

This SDG does not contain re-extraction, re-analysis or dilution.

11. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

12. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

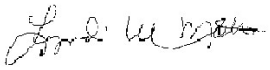
Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
I	The laboratory indicated the presence of chemical interference during the sample analysis.
P	The amount reported is the maximum possible concentration due to possible chlorinated diphenylether interference

13. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: November 10, 2011

PEER REVIEW BY: Joseph C. Houser

DATE: November 10, 2011

VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR1143 - Dioxin

ANALYTE		PRR1GWUPF-01	LQ	VQ
1,2,3,4,6,7,8-HpCDD	pg/L	57		
1,2,3,4,6,7,8-HpCDF	pg/L	40.6		
1,2,3,4,7,8,9-HpCDF	pg/L	5.36	J	J
1,2,3,4,7,8-HxCDD	pg/L	3.59	J	J
1,2,3,4,7,8-HxCDF	pg/L	337		
1,2,3,6,7,8-HxCDD	pg/L	29.4		
1,2,3,6,7,8-HxCDF	pg/L	147		
1,2,3,7,8,9-HxCDD	pg/L	13.9	J	J
1,2,3,7,8,9-HxCDF	pg/L	12.6	J	J
1,2,3,7,8-PeCDD	pg/L	5.12	U,EMPC	U,EMPC
1,2,3,7,8-PeCDF	pg/L	49		
2,3,4,6,7,8-HxCDF	pg/L	19.8	J	J
2,3,4,7,8-PeCDF	pg/L	592		
2,3,7,8-TCDD	pg/L	1.72	U,EMPC	U,EMPC
2,3,7,8-TCDF	pg/L	93.3		
OCDD	pg/L	101	B	
OCDF	pg/L	12.3	J	J
Total HpCDD	pg/L	102		
Total HpCDF	pg/L	56.5		
Total HxCDD	pg/L	188		
Total HxCDF	pg/L	1030		
Total PeCDD	pg/L	153		
Total PeCDF	pg/L	6206		
Total TCDD	pg/L	223		
Total TCDF	pg/L	9070		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID:	PRR1GWUPF-01				EPA Method 1613
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33420-001
Project:	PRR1143	Sample Size:	0.944 L	QC Batch No.:	4060
Date Collected:	19-Oct-11			Date Analyzed DB-5:	27-Oct-11
Time Collected:	1300			Date Received:	21-Oct-11
				Date Extracted:	24-Oct-11
				Dates Analyzed DB-225:	27-Oct-11

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND		1.72	
1,2,3,7,8-PeCDD	ND		5.12	
1,2,3,4,7,8-HxCDD	3.59			J
1,2,3,6,7,8-HxCDD	29.4			
1,2,3,7,8,9-HxCDD	13.9			J
1,2,3,4,6,7,8-HpCDD	57.0			
OCDD	101			J
2,3,7,8-TCDF	93.3			
1,2,3,7,8-PeCDF	49.0			
2,3,4,7,8-PeCDF	592			
1,2,3,4,7,8-HxCDF	337			
1,2,3,6,7,8-HxCDF	147			
2,3,4,6,7,8-HxCDF	19.8			J
1,2,3,7,8,9-HxCDF	12.6			J
1,2,3,4,6,7,8-HpCDF	40.6			
1,2,3,4,7,8,9-HpCDF	5.36			J
OCDF	12.3			J

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	79.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	94.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	92.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.3	23 - 140	
	13C-OCDD	82.2	17 - 157	
	13C-2,3,7,8-TCDF	89.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	83.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	84.1	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	84.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	90.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	86.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	86.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	79.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	75.3	26 - 138	
	13C-OCDF	81.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	110	35 - 197	

Totals		
Total TCDD	223	225
Total PeCDD	153	159
Total HxCDD	188	
Total HpCDD	102	
Total TCDF	9070	
Total PeCDF	6210	
Total HxCDF	1030	1030
Total HpCDF	56.5	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 246

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Calvin Tanaka 31-Oct-2011 13:54

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #: [redacted]

33420 3.5°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	UPF Groundwater	PRR1143	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1GWUPF-01	10/19/2011	13:00	Water	Grab	6	X																				Submit for MS/MSD

Requested Analyses
1 Dioxins
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Special Instructions/Comments:

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: Vista Analytical

Shipping Tracking # 7976 4248 9170

Specify Turnaround Requirements: Standard TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kevin Gardelli	10/19/11	1800	Bethany Benedict 10/21/11 0856				

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan RAWP QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

PCBs and Metals Analyses

SDG# PRR1143 (200-7626)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #15070R
Project: B0009964.0001.29103

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1143 (200-7626) for samples collected in association with the Tierra Solutions, Inc. – Upland Processing Facility Site. Data were reviewed in accordance with Environmental Data Services SOPs V-5 "Verification/Validation Metals" Revision 0, January 2009 and USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010); and V-4 "Verification/Validation Aroclor PCBs", Revision 0, January 2009, and USEPA National Functional Guidelines for Organic Superfund Data Review (June 2008).

This report contains the results of the data evaluation as per SOP V-5 and V-4 including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	MISC
PRR1GWUPF-01	200-7626-1	Water	10/19/2011				X	X	

Aroclor PCBs by USEPA SOM0.1.2.
Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1GWUPF-01 for PCB analysis. 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
PRR1GWUPF-01	Aroclor 1016	>UL	>UL

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.	Detect	No Action
	Non-detect	

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction or re-analysis.

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
PRR1GWUPF-01	Aroclor 1248	41 E	49 D	49 D

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

The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide/Aroclor analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification criteria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

10. Overall Assessment

Overall 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.

TOTAL METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The matrix spike recoveries were less than the control limit but greater than 30% for barium and lead, indicating potential low bias for positive and non-detect results for the affected analytes in the associated samples. Project accuracy measurement performance criteria were not met for the affected analytes.

Matrix Interference – The serial dilution percent difference (%D) were greater than the acceptance limit for five analytes. Project accuracy measurement performance criteria were not met for the affected analytes.

Accuracy/Bias - The method blank exhibited low level concentrations of many analytes. Silver and thallium were detected in the sample at a concentration less than five times the method blank concentration; therefore, silver and thallium in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

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 required no further qualification. 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
PRR1GWUPF-01	Silver (MB) Thallium (MB)	Detected sample results <RL and <BAL	"UB" at the RL

RL = reporting limit
MB = Method Blank

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

Sample PRR1GWUPF-01 was selected for MS analysis. Some recoveries were below the control limits (75-125%). The observed recoveries for the analytes listed in the table below did not meet accuracy acceptance criteria, indicating potential low bias in associated samples. Project accuracy/bias measurement performance criteria were not met. Matrix spike recoveries and validation qualification are described in the following tables.

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
PRR1GWUPF-01	Barium	59%
	Lead	53%

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

Control limit	Sample Result	Qualification
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
PRR1GWUPF-01	Barium	59%	90%
	Lead	53%	97%

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
MS/MSD percent recovery <75% but >30%	PS percent recovery >75%	Non-detect	UJ
		Detect	J
	PS percent recovery <75%	Non-detect	UJ
		Detect	J

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1GWUPF-01 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. SERIAL DILUTION

Sample PRR1GWUPF-01 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all elements met method measurement performance criteria with the following exceptions. The observed %D for arsenic, calcium, nickel, and vanadium did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes.

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)
PRR1GWUPF-01	Arsenic	11%
	Calcium	12%
	Nickel	12%
	Vanadium	29%

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

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

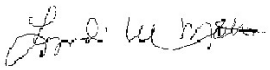
The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.

Qualifier	Description
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott – Data Quality Specialist

SIGNATURE:



DATE: November 18, 2011

PEER REVIEW BY: Joseph C. Houser

DATE: November 18, 2011

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR1143 - PCBs

ANALYTE		PRR1GWUPF-01	LQ	VQ
Aroclor-1016	ug/L	1	U	U
Aroclor-1221	ug/L	1	U	U
Aroclor-1232	ug/L	1	U	U
Aroclor-1242	ug/L	1	U	U
Aroclor-1248	ug/L	49	D	D
Aroclor-1254	ug/L	1	U	U
Aroclor-1260	ug/L	1	U	U
Aroclor-1262	ug/L	1	U	U
Aroclor-1268	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR1143 - Inorganics

ANALYTE		PRR1GWUPF-01	LQ	VQ
Aluminum	ug/L	125		
Antimony	ug/L	13.5		
Arsenic	ug/L	91.6	E	J
Barium	ug/L	64.2	N	J
Beryllium	ug/L	1	U	U
Cadmium	ug/L	0.27	J	J
Calcium	ug/L	72100	E	J
Chromium	ug/L	67.6		
Cobalt	ug/L	13		
Copper	ug/L	12.2		
Iron	ug/L	1,520		
Lead	ug/L	47.2	N	J
Magnesium	ug/L	198,000		
Manganese	ug/L	277		
Mercury	ug/L	0.2	U	U
Nickel	ug/L	29.3	E	J
Potassium	ug/L	43,700		
Selenium	ug/L	22.1		
Silver	ug/L	1	J	UB
Sodium	ug/L	307,000		
Thallium	ug/L	1	J	UB
Vanadium	ug/L	29.7	E	J
Zinc	ug/L	96.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Client: ARCADIS U.S. Inc

Job Number: 200-7626-1
Sdg Number: PRR1143

Client Sample ID: **PRR1GWUPF-01**

Lab Sample ID: 200-7626-1
Client Matrix: Water

Date Sampled: 10/19/2011 1300
Date Received: 10/20/2011 1020

SOM01.2/PCB Aroclors

Analysis Method:	SOM01.2/PCB	Analysis Batch:	200-28846	Instrument ID:	5253.i
Prep Method:	SEPF	Prep Batch:	200-27381	Initial Weight/Volume:	975 mL
Dilution:	1.0			Final Weight/Volume:	10000 uL
Analysis Date:	11/14/2011 2039			Injection Volume:	1 uL
Prep Date:	10/25/2011 0922			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	RL
Aroclor-1016	1.0	U	1.0
Aroclor-1221	1.0	U	1.0
Aroclor-1232	1.0	U	1.0
Aroclor-1242	1.0	U	1.0
Aroclor-1248	~~41~~ 49 D ~~E~~		1.0
Aroclor-1254	1.0	U	1.0
Aroclor-1260	1.0	U	1.0
Aroclor-1262	1.0	U	1.0
Aroclor-1268	1.0	U	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	79		30 - 150
Decachlorobiphenyl	48		30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-7626-1
Sdg Number: PRR1143

Client Sample ID: **PRR1GWUPF-01**

Lab Sample ID: 200-7626-1
Client Matrix: Water

Date Sampled: 10/19/2011 1300
Date Received: 10/20/2011 1020

SOM01.2/PCB Aroclors

Analysis Method:	SOM01.2/PCB	Analysis Batch:	200-28846	Instrument ID:	5253.i
Prep Method:	SEPF	Prep Batch:	200-27381	Initial Weight/Volume:	975 mL
Dilution:	10			Final Weight/Volume:	10000 uL
Analysis Date:	11/14/2011 2015	Run Type:	DL	Injection Volume:	1 uL
Prep Date:	10/25/2011 0922			Result Type:	SECONDARY

Analyte	Result (ug/L)	Qualifier	RL
Aroclor-1016	10	U	10
Aroclor-1221	10	U	10
Aroclor-1232	10	U	10
Aroclor-1242	10	U	10
Aroclor-1248	49	D	10
Aroclor-1254	10	U	10
Aroclor-1260	10	U	10
Aroclor-1262	10	U	10
Aroclor-1268	10	U	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	95		30 - 150
Tetrachloro-m-xylene	93		30 - 150
Decachlorobiphenyl	55		30 - 150
Decachlorobiphenyl	58		30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-7626-1
Sdg Number: PRR1143

Client Sample ID: **PRR1GWUPF-01**

Lab Sample ID: 200-7626-1
Client Matrix: Water

Date Sampled: 10/19/2011 1300
Date Received: 10/20/2011 1020

ISM01.2/HG ISM01.2 Mercury

Analysis Method:	ISM01.2/HG	Analysis Batch:	200-28484	Instrument ID:	MEPCV3
Prep Method:	7470A	Prep Batch:	200-28386	Lab File ID:	110911A.PRN
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2011 1452			Final Weight/Volume:	50 mL
Prep Date:	11/08/2011 1030				

Analyte	Result (ug/L)	Qualifier	MDLE	RL
Mercury	0.20	U	0.037	0.20

ISM01.2/ICPMS ISM01.2 Metals (ICPMS)

Analysis Method:	ISM01.2/ICPMS	Analysis Batch:	200-28354	Instrument ID:	METICPMS2
Prep Method:	200.8	Prep Batch:	200-27171	Lab File ID:	110711-04ISM.xml
Dilution:	1.0			Initial Weight/Volume:	100 mL
Analysis Date:	11/07/2011 2120			Final Weight/Volume:	100 mL
Prep Date:	10/21/2011 0830				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Beryllium	1.0	U	0.12	1.0
Nickel	29.3	J E	0.14	1.0

Analysis Method:	ISM01.2/ICPMS	Analysis Batch:	200-28936	Instrument ID:	METICPMS2
Prep Method:	200.8	Prep Batch:	200-28443	Lab File ID:	111411-03ISMA.xml
Dilution:	1.0			Initial Weight/Volume:	100 mL
Analysis Date:	11/14/2011 1516			Final Weight/Volume:	100 mL
Prep Date:	11/09/2011 0800				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Aluminum	125		4.1	20.0
Antimony	13.5		0.15	2.0
Barium	64.2	J N	0.25	10.0
Cadmium	0.27	J	0.11	1.0
Chromium	67.6		0.21	2.0
Cobalt	13.0		0.020	1.0
Copper	12.2		0.60	2.0
Iron	1520		7.9	200
Lead	47.2	J N	0.10	1.0
Selenium	22.1		0.15	5.0
Silver	~~0.15~~ 1.0 UB	J	0.028	1.0
Thallium	~~0.23~~ 1.0 UB	J	0.011	1.0
Vanadium	29.7	J E	0.26	5.0
Zinc	96.4		0.57	2.0

Analysis Method:	ISM01.2/ICPMS	Analysis Batch:	200-28936	Instrument ID:	METICPMS2
Prep Method:	200.8	Prep Batch:	200-28443	Lab File ID:	111411-03ISMA.xml
Dilution:	10			Initial Weight/Volume:	100 mL
Analysis Date:	11/14/2011 1555			Final Weight/Volume:	100 mL
Prep Date:	11/09/2011 0800				

Client: ARCADIS U.S. Inc

Job Number: 200-7626-1
Sdg Number: PRR1143

Client Sample ID: **PRR1GWUPF-01**

Lab Sample ID: 200-7626-1
Client Matrix: Water

Date Sampled: 10/19/2011 1300
Date Received: 10/20/2011 1020

ISM01.2/ICPMS ISM01.2 Metals (ICPMS)

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	91.6	J E	1.6	10.0
Calcium	72100	J E	260	5000
Magnesium	198000		120	5000
Manganese	277		1.0	10.0
Potassium	43700		100	5000

Analysis Method:	ISM01.2/ICPMS	Analysis Batch:	200-28271	Instrument ID:	METICPMS2
Prep Method:	200.8	Prep Batch:	200-27171	Lab File ID:	110511-03.xml
Dilution:	20			Initial Weight/Volume:	100 mL
Analysis Date:	11/05/2011 1708			Final Weight/Volume:	100 mL
Prep Date:	10/21/2011 0830				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Sodium	307000		280	10000

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yracuse, NY 13214
hone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

ROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
0009964.0002.70004	UPF Groundwater	PRR1143	

AMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
RR1GWUPF-01	10/19/2011	13:00	Water	Grab	9	X	X																			Submit for MS/MSD

Requested Analyses	
1	Aroclor PCBs
2	TAL Metals plus Mercury
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Special Instructions/Comments:

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica - Burlington, VT

Shipping Tracking # 7976 4248 2289

Specify Turnaround Requirements: Standard TAT

☑ Cooler packed with ice

☐ Cooler custody seal intact N/A

Sample Receipt: OK

Condition/Cooler Temp: 1.0°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	10/19/11	1300	[signature]	10/20/11 1020			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

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TIERRA SOLUTIONS, INC. – Waste Characterization QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

TCLP Volatile, Semivolatile, Pesticide, Chlorinated Herbicides, Metals, PCB, Cyanide and Miscellaneous Analyses

SDG# WC02 (200-8445)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #15338R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #WC02 (200-8445) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG; USEPA National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), USEPA National Functional Guidelines for Inorganic Superfund Data Review (January 2010); and EPA Region 2 Data Validation SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB	MET	MISC
PRR1WC-CS03	200-8445-01	Soil	12/6/2011		X	X	X	X	X

Miscellaneous parameters include TCLP Chlorinated Herbicides by SW846 1311/8151A, Free Liquids Test by SW846 9095B, Burn Rate by SW846 1030, Cyanide by USEPA ISM01.2, Sulfide by SW846 9034 and pH by SW846 9045D.

TCLP Volatiles, TCLP Semivolatiles, TCLP Pesticides, by SW846 1311 and USEPA SOM0.1.2.

PCBs by USEPA SOM0.1.2

TCLP Metals by SW846 1311 and USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

TCLP SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias - The surrogate, 4-methylphenol-d8 exhibited a recovery slightly above the upper control limit for sample location PRR1WC-CS03. The associated compounds were not detected in the sample. Therefore, there is no affect on the data.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the samples in this sample delivery group were performed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WC-CS03	Phenol-d5	AC
	Bis(2-chloroethyl)ether-d8	AC
	2-Chlorophenol-d4	AC
	4-Methylphenol-d8	> UL
	Nitrobenzene-d5	AC

Sample Locations	Surrogate	Recovery
PRR1WC-CS03	2-Nitrophenol-d4	AC
	2,4-Dichlorophenol-d3	AC
	4-Chloroaniline-d4	AC
	Dimethylphthalate-d6	AC
	Acenapthylene-d8	AC
	4-Nitrophenol-d4	AC
	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

The compounds associated with the surrogate deviation were non-detect. Therefore no action was required.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS03 for semivolatile analysis. All recoveries were observed within acceptable limits.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits, corrected for TCLP fluid volume, met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

9. Overall Assessment

Overall 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.

TCLP VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The leachate method blank exhibited concentration of 2-butanone greater than the practical quantitation limit (PQL), which was detected in a sample at concentrations less than five times the method blank concentration. Therefore, 2-butanone in the sample is most likely from laboratory contamination.

Accuracy/Bias – The matrix spike recoveries were greater than the control limit for trichloroethene, indicating potential high bias for positive results for the affected compounds in the associated samples. Project accuracy measurement performance criteria were not met for the affected compound.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The compound 2-Butanone was detected in the associated leachate method blank above the project quantitation limits (PQL) during volatile analysis. This compound was detected in sample location PRR1WC-CS03 at concentration less than five times the leachate method blank concentration; therefore, 2-butanone in the sample is most likely from laboratory contamination. The sample results are reported at the detected sample concentration and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate

overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WC-CS03	Vinyl chloride-d3	AC
	Chloroethane-d5	AC
	1.1-Dichloroethene-d2	AC
	2-Butanone-d5	> UL
	Chloroform-d	> UL
	1,2-Dichloroethane-d4	AC
	Benzene-d6	AC
	1,2-Dichloropropane	AC
	Toluene-d8	AC
	trans-1,3-Dichloropopene-d4	AC
	2-Hexanone-d5	> UL
	1,4-Dioxane-d8	AC
	1,1,2,2-Tetrachloroethane-d2	> UL
	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 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

Chloroform was detected in the associated sample. Therefore, the sample result for chloroform may be biased high and is flagged J.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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
PRR1WC-CS03	Trichloroethene	>UL	>UL

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	

Trichloroethene results did not meet accuracy acceptance criteria. The matrix spike recoveries indicate potential high bias in associated samples. Project accuracy/bias measurement performance criteria were not met. The trichloroethene results are qualified as estimated with 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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).

U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

9. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Practical Quantitation Limit – The sample extract for PCB analysis was analyzed at a 100-fold dilution. All PCBs were non-detect. The reporting limits did not meet the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WC-CS03	Tetrachloro-m-xylene	D
	Decachlorobiphenyl	D

D - Diluted

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	
Surrogates diluted below the calibration curve due to the high concentration of a target compound.	Non-detect	UJ[1]
	Detect	J[1]

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

Reported sample surrogate recoveries were diluted below the calibration range. Extraction efficiency can't be determined.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS and MSD were diluted below the calibration range. Matrix spike recoveries can't be determined.

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains dilution of the sample extract. All PCBs and surrogates are diluted below the calibration range. The case narrative stated that the PCB screen analysis indicated there were non-target compounds at significant concentration and matrix interference. Therefore, the sample was analyzed at a 100 fold dilution and more concentrated analysis was not performed. As a result, the contract laboratory (TestAmerica) reporting limits did not meet the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide/Aroclor analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

10. Overall Assessment

Overall 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.

TCLP PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias - The leachate method blank exhibited low level concentration of heptachlor, which was detected in a sample at concentrations less than five times the leachate method blank concentration. Therefore, heptachlor in the sample is most likely from laboratory contamination.

Accuracy - When dual column analysis is performed, the percent difference (%D) of detected sample results must less than 25%. Many compounds were flagged “P” by the laboratory indicating the %D exceeded 25%.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The leachate method blank exhibited concentration of heptachlor greater than the method detection limit (MDL) but less than the PQL. This compound was detected in sample location PRR1WC-CS03 at concentration less than five times the leachate method blank concentration; therefore, heptachlor in the sample is most likely from laboratory contamination. The sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate

overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS03 for pesticide analysis. All recoveries reported from the primary column were observed within acceptable limits.

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

Compound Identification

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
PRR1WC-CS03	gamma-BHC	104.5%
	Heptachlor epoxide	125.5%
	Endrin	999.9%
	Methoxychlor	518.0%

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 >PQL and %D >25% to 50%	J
Sample results >PQL and %D >50% to 100%	JN
Sample results >PQL and %D >100% [1]	R
Sample results >PQL and %D >100% to 200% (Interference detected)[2]	J or JN
Sample results <PQL 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 PQL and reported as non-detect.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for pesticide analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

10. Overall Assessment

Overall 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.

TCLP CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias - The method blank exhibited low level concentrations of 2,4-D, which was also detected in a samples. See Section 2 for details.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

The method blank exhibited a concentration greater than the MDL and less than the PQL for 2,4-D. 2,4-D was detected in sample location PRR1WC-CS03 at concentration greater than five times the method blank concentration. Sample results are not affected by the laboratory contamination. Qualification resulted in the removal of the laboratory qualifier (B) of data.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WC-CS03 for herbicide analysis. The sample concentration for 2,4-D was four times greater than the spike concentration. Therefore, recovery acceptance limits do not apply. The MS and MSD recoveries for Silvex (2,4,5-TP) were within acceptance limits.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction or re-analysis. It does contain a secondary dilution due to target compound that exceeded the calibration range. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

Compound Identification

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
PRR1WC-CS03	Silvex (2,4,5-TP)	75.2%

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 >PQL and %D >25% to 50%	J
Sample results >PQL and %D >50% to 100%	JN
Sample results >PQL and %D >100% [1]	R
Sample results >PQL and %D >100% to 200% (Interference detected)[2]	J or JN
Sample results <PQL and %D >50%	U

When the herbicide sample result is less than the RL and the %D greater than 50%, the sample result is raised to the PQL and reported as non-detect.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
P	The percent difference between the primary and confirmation column for herbicide analyses is greater than 25 percent.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

10. Overall Assessment

Overall 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.

TCLP METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The matrix spike recoveries were less than the control limit for silver, indicating potential low bias for positive and non-detect results for the affected analytes in the associated samples. Project accuracy measurement performance criteria were not met for the affected analyte.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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
PRR1WC-CS03	Silver	30%

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
PRR1WC-CS03	Silver	30%	105%

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 percent recovery <30%	PS percent recovery >75%	Non-detect	UJ
		Detect	J
	PS percent recovery <75%	Non-detect	R
		Detect	J

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WC-CS03 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The distillation and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed on sample PRR1WC-CS03 for cyanide analysis. All reported recoveries were observed within acceptable limits.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WC-CS03 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

SULFIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – The matrix spike/matrix spike duplicate recoveries were less than the control limit, indicating potential low bias for positive and non-detect results for the affected analytes in the associated samples. Project accuracy measurement performance criteria were not met for the affected analyte. See Section 4.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the samples in this sample delivery group (SDG) was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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	MSD Recovery
PRR1WC-CS03	Sulfide	26%	24%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of a MS/MSDS 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 10% to 74%	Non-detect	UJ
	Detect	J
MS/MSD percent recovery <10%	Non-detect	R
	Detect	J
MS/MSD percent recovery >125%	Non-detect	No Action
	Detect	J

Sulfide results did not meet accuracy acceptance criteria. The MS/MSD recoveries indicate potential low bias in associated samples. Project accuracy/bias measurement performance criteria were not met. The sulfide results are qualified as estimated with J.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
J	Inorganics – The reported value was obtained from an instrument reading that was less than the project quantitation limit (PQL).
D	The analyte was quantitated from a diluted analysis.
E	Inorganics – The reported value is estimated because of the presence of an interference.
N	The inorganic analysis is associated with a spike sample not within control limits.
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
*	The inorganic duplicate analysis was not within the established quality control (QC) limit.

pH DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy – The analysis for pH slightly exceeded the QAPP specified hold time of 48 hours from collection.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) exceeded the QAPP holding time. The holding time in the QAPP was listed as 48 hours from collection. The analysis was performed approximately 3 hours past the hold time. Since the time beyond the hold time is minimal, there should be no affect on the data. No further qualification was required.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, pH was successfully measured during the LCS determinations.

3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WC-CS03 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for pH met project measurement performance criteria

FREE LIQUID AND BURN RATE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were completed within the QAPP holding time.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

An LCS is not required for free liquids or burn rate.

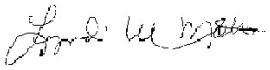
3. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WC-CS03 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: January 4, 2012

PEER REVIEW: Joseph C. Houser

DATE: January 5, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - PCBs

ANALYTE		PRR1WC-CS03	LQ	VQ
Aroclor-1016	ug/kg	5500	U	UJ
Aroclor-1221	ug/kg	5500	U	UJ
Aroclor-1232	ug/kg	5500	U	UJ
Aroclor-1242	ug/kg	5500	U	UJ
Aroclor-1248	ug/kg	5500	U	UJ
Aroclor-1254	ug/kg	5500	U	UJ
Aroclor-1260	ug/kg	5500	U	UJ
Aroclor-1262	ug/kg	5500	U	UJ
Aroclor-1268	ug/kg	5500	U	UJ

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - Pesticides

ANALYTE		PRR1WC-CS03	LQ	VQ
Endrin	ug/L	0.094	JP	U
Gamma-BHC (Lindane)	ug/L	0.047	JP	U
Heptachlor	ug/L	0.047	JPB	UB
Heptachlor Epoxide	ug/L	0.047	JP	U
Methoxychlor	ug/L	0.47	JP	U
Technical Chlordane	ug/L	0.47	U	U
Toxaphene	ug/L	4.7	U	U

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - Herbicides

ANALYTE		PRR1WC-CS03	LQ	VQ
2,4,5-TP	ug/L	0.4	Jp	U
2,4-D	ug/L	150	EB	D

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - VOCs

ANALYTE		PRR1WC-CS03	LQ	VQ
1,1-Dichloroethene	ug/L	5	U	U
1,2-Dichloroethane	ug/L	5	U	U
1,4-Dichlorobenzene	ug/L	5	U	U
2-Butanone	ug/L	35	B	UB
Benzene	ug/L	5	U	U
Carbon Tetrachloride	ug/L	5	U	U
Chlorobenzene	ug/L	5	U	U
Chloroform	ug/L	52		J
Tetrachloroethene	ug/L	0.098	J	J
Trichloroethene	ug/L	22		J
Vinyl Chloride	ug/L	5	U	U

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - SVOCs

ANALYTE		PRR1WC-CS03	LQ	VQ
2,4,5-Trichlorophenol	ug/L	120		
2,4,6-Trichlorophenol	ug/L	55		
2,4-Dinitrotoluene	ug/L	25	U	U
2-Methylphenol	ug/L	25	U	U
4-Methylphenol	ug/L	25	U	U
Cresol	ug/L	25	U	U
Hexachlorobutadiene	ug/L	25	U	U
Hexachloroethane	ug/L	25	U	U
Nitrobenzene	ug/L	25	U	U
Pentachlorophenol	ug/L	50	U	U
Pyridine	ug/L	0.39	J	J

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - Inorganics

ANALYTE		PRR1WC-CS03	LQ	VQ
Arsenic	ug/L	9.5	J	J
Barium	ug/L	369		
Cadmium	ug/L	5	U	U
Chromium	ug/L	269		
Cyanide	mg/kg	0.31	J	J
Lead	ug/L	13.9		
Mercury	ug/L	0.2	U	U
Selenium	ug/L	8.7	J	J
Silver	ug/L	10	UN	UJ

Verification Validation Data Table
UPF Soil Waste Characterization - WC QAPP
Test America
WC02 - Miscellaneous

ANALYTE		PRR1WC-CS03	LQ	VQ
Burn Rate	mm/sec	2.2	U	U
Free Liquid	mL/100g	Absent		
pH	SU	12	HF	
Sulfide	mg/kg	14.6	U	UJ

SAMPLE ANALYSIS DATA SHEETS AND COCs

Client: ARCADIS U.S. Inc

Job Number: 200-8445-1
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

SOM01.2/VOA Low/Medium Volatiles-TCLP

Analysis Method:	SOM01.2/VOA	Analysis Batch:	200-30798	Instrument ID:	N.i
Prep Method:	SOM01.2/VOA_PR	Prep Batch:	N/A	Lab File ID:	nfea19.d
Dilution:	1.0	Leach Batch:	200-30568	Initial Weight/Volume:	5 mL
Analysis Date:	12/15/2011 1722			Final Weight/Volume:	5 mL
Prep Date:	12/15/2011 1722				
Leach Date:	12/13/2011 1145				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
Vinyl chloride		5.0	U	5.0
1,1-Dichloroethene		5.0	U	5.0
2-Butanone		35 UB	~~B~~	10
Chloroform		52 J		5.0
Carbon tetrachloride		5.0	U	5.0
Benzene		5.0	U	5.0
1,2-Dichloroethane		5.0	U	5.0
Trichloroethene		22 J		5.0
Tetrachloroethene		0.098	J	5.0
Chlorobenzene		5.0	U	5.0
1,4-Dichlorobenzene		5.0	U	5.0

Surrogate	%Rec	Qualifier	Acceptance Limits
Vinyl chloride-d3	92		65 - 131
Chloroethane-d5	103		71 - 131
1,1-Dichloroethene-d2	80		55 - 104
2-Butanone-d5	229	*	49 - 155
Chloroform-d	148	*	78 - 121
1,2-Dichloroethane-d4	100		78 - 129
Benzene-d6	105		77 - 124
1,2-Dichloropropane-d6	101		79 - 124
Toluene-d8	105		77 - 121
trans-1,3-Dichloropropene-d4	103		73 - 121
2-Hexanone-d5	230	*	28 - 135
1,4-Dioxane-d8	109		50 - 150
1,1,2,2-Tetrachloroethane-d2	0	*	73 - 125
1,2-Dichlorobenzene-d4	107		80 - 131

Client: ARCADIS U.S. Inc

Job Number: 200-8445-1
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

SOM01.2/SV Semivolatiles-TCLP

Analysis Method:	SOM01.2/SV	Analysis Batch:	200-31040	Instrument ID:	R.i
Prep Method:	SOM01.2SV_CLLE	Prep Batch:	200-30614	Lab File ID:	rjqha06.d
Dilution:	1.0	Leach Batch:	200-30524	Initial Weight/Volume:	200 mL
Analysis Date:	12/20/2011 0837			Final Weight/Volume:	1000 uL
Prep Date:	12/13/2011 2213			Injection Volume:	2 uL
Leach Date:	12/12/2011 1717				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
Pyridine		0.39	J	25
2-Methylphenol		25	U	25
4-Methylphenol		25	U	25
Hexachloroethane		25	U	25
Nitrobenzene		25	U	25
Hexachlorobutadiene		25	U	25
2,4,6-Trichlorophenol		55		25
2,4,5-Trichlorophenol		120		25
2,4-Dinitrotoluene		25	U	25
Pentachlorophenol		50	U	50
Total Cresols		25	U	25

Surrogate	%Rec	Qualifier	Acceptance Limits
Phenol-d5	89		39 - 106
Bis(2-chloroethyl)ether-d8	78		40 - 105
2-Chlorophenol-d4	84		41 - 106
4-Methylphenol-d8	115	*	25 - 111
Nitrobenzene-d5	93		43 - 108
2-Nitrophenol-d4	95		40 - 108
2,4-Dichlorophenol-d3	100		37 - 105
4-Chloroaniline-d4	81		1 - 145
Dimethylphthalate-d6	94		47 - 114
Acenaphthylene-d8	91		41 - 107
4-Nitrophenol-d4	63		33 - 116
Fluorene-d10	89		42 - 111
4,6-Dinitro-2-methylphenol-d2	82		22 - 104
Anthracene-d10	95		44 - 110
Pyrene-d10	90		52 - 119
Benzo(a)pyrene-d12	99		32 - 121

Client: ARCADIS U.S. Inc

Job Number: 200-8445-1
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

SOM01.2/Pest Pesticides-TCLP

Analysis Method:	SOM01.2/Pest	Analysis Batch:	200-30815	Instrument ID:	5005.i
Prep Method:	SOM01.2Pes_SFE	Prep Batch:	200-30607	Initial Weight/Volume:	1060 mL
Dilution:	1.0	Leach Batch:	200-30524	Final Weight/Volume:	10000 uL
Analysis Date:	12/15/2011 0038			Injection Volume:	1 uL
Prep Date:	12/13/2011 1942			Result Type:	PRIMARY
Leach Date:	12/12/2011 1717				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	RL
gamma-BHC (Lindane)		~~0.018~~ 0.047U	~~JP~~	0.047
Heptachlor		~~0.0049~~ 0.047UB	~~LP B~~	0.047
Heptachlor epoxide		~~0.013~~ 0.047U	~~JP~~	0.047
Endrin		~~0.011~~ 0.094U	~~JP~~	0.094
Methoxychlor		~~0.0031~~ 0.47U	~~JP~~	0.47
Toxaphene		4.7	U	4.7
Chlordane (technical)		0.47	U	0.47

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	111		30 - 150
Tetrachloro-m-xylene	105		30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-8445-2
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	200-31004	Instrument ID:	0911.i
Prep Method:	8151A	Prep Batch:	200-30670	Initial Weight/Volume:	950 mL
Dilution:	2.0	Leach Batch:	200-30524	Final Weight/Volume:	10000 uL
Analysis Date:	12/19/2011 1512			Injection Volume:	1 uL
Prep Date:	12/14/2011 1242			Result Type:	PRIMARY
Leach Date:	12/12/2011 1717				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
2,4-D		150 D	~~E B~~	0.027	1.0
Silvex (2,4,5-TP)		~~0.079~~ 0.41 U	~~J p~~	0.0012	0.40

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	122	p	60 - 130

Client: ARCADIS U.S. Inc

Job Number: 200-8445-2
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

8151A Herbicides (GC)-TCLP

Analysis Method:	8151A	Analysis Batch:	200-31004	Instrument ID:	0911.i
Prep Method:	8151A	Prep Batch:	200-30670	Initial Weight/Volume:	950 mL
Dilution:	20	Leach Batch:	200-30524	Final Weight/Volume:	10000 uL
Analysis Date:	12/19/2011 1445	Run Type:	DL	Injection Volume:	1 uL
Prep Date:	12/14/2011 1242			Result Type:	SECONDARY
Leach Date:	12/12/2011 1717				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
2,4-D		150	B D	0.27	10
Silvex (2,4,5-TP)		0.11	J p D	0.012	4.0

Surrogate	%Rec	Qualifier	Acceptance Limits
2,4-Dichlorophenylacetic acid	155	p D X	60 - 130
2,4-Dichlorophenylacetic acid	546	D X	60 - 130

Client: ARCADIS U.S. Inc

Job Number: 200-8445-1
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

% Moisture: 40.5

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

SOM01.2/PCB Aroclors

Analysis Method:	SOM01.2/PCB	Analysis Batch:	200-30597	Instrument ID:	5253.i
Prep Method:	SOM01.2PCB_SONC	Prep Batch:	200-30424	Initial Weight/Volume:	30.38 g
Dilution:	100			Final Weight/Volume:	10000 uL
Analysis Date:	12/13/2011 0824			Injection Volume:	1 uL
Prep Date:	12/09/2011 1708			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	RL
Aroclor-1016		5500	U	5500
Aroclor-1221		5500	U	5500
Aroclor-1232		5500	U	5500
Aroclor-1242		5500	U	5500
Aroclor-1248		5500	U	5500
Aroclor-1254		5500	U	5500
Aroclor-1260		5500	U	5500
Aroclor-1262		5500	U	5500
Aroclor-1268		5500	U	5500

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	0	D	30 - 150
Decachlorobiphenyl	0	D	30 - 150

Client: ARCADIS U.S. Inc

Job Number: 200-8445-1
Sdg Number: WC02

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

ISM01.2/HG ISM01.2 Mercury-TCLP

Analysis Method:	ISM01.2/HG	Analysis Batch:	200-30941	Instrument ID:	MEPCV3 II
Prep Method:	ISM01.2/HG	Prep Batch:	200-30804	Lab File ID:	121911BB.PRN
Dilution:	1.0	Leach Batch:	200-30524	Initial Weight/Volume:	50 mL
Analysis Date:	12/19/2011 1124			Final Weight/Volume:	50 mL
Prep Date:	12/14/2011 1215				
Leach Date:	12/12/2011 1717				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDLE	RL
Mercury		0.20	U	0.084	0.20

ISM01.2/ICP ISM01.2 Metals (ICP)-TCLP

Analysis Method:	ISM01.2/ICP	Analysis Batch:	200-30845	Instrument ID:	METICP7
Prep Method:	ISM01.2/ICP	Prep Batch:	200-30648	Lab File ID:	121511-04.ttx
Dilution:	1.0	Leach Batch:	200-30524	Initial Weight/Volume:	100 mL
Analysis Date:	12/16/2011 0233			Final Weight/Volume:	100 mL
Prep Date:	12/14/2011 1131				
Leach Date:	12/12/2011 1717				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
Arsenic		9.5	J	3.2	10.0
Barium		369		3.5	200
Cadmium		5.0	U	0.37	5.0
Chromium		269		1.0	10.0
Lead		13.9		2.5	10.0
Selenium		8.7	J	3.9	35.0
Silver		10.0 U3	~~UN~~	0.81	10.0

General Chemistry

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

% Moisture: 40.5

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Cyanide	0.31	J	mg/Kg	0.14	0.80	1.0	ISM01.2/CN

Analysis Batch: 200-30744 Analysis Date: 12/15/2011 1414 DryWt Corrected: Y
Prep Batch: 200-30715 Prep Date: 12/15/2011 0930

General Chemistry

Client Sample ID: **PRR1WC-CS03**

Lab Sample ID: 200-8445-1
Client Matrix: Solid

% Moisture: 40.5

Date Sampled: 12/06/2011 1330
Date Received: 12/07/2011 1140

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfide	14.6	U5 U	mg/Kg	5.4	14.6	1.0	9034
Analysis Batch: 460-96374	Analysis Date: 12/13/2011 1700						DryWt Corrected: Y
Prep Batch: 460-96372	Prep Date: 12/13/2011 1037						

Analyte	Result	Qual	Units			Dil	Method
pH	12.0	HF	SU			1.0	9045D
Analysis Batch: 200-30350	Analysis Date: 12/08/2011 1635						DryWt Corrected: N
Free Liquid	Absent		mL/100g			1.0	9095B
Analysis Batch: 200-30372	Analysis Date: 12/08/2011 1930						DryWt Corrected: N

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Burn Rate	2.20	U	mm/sec	2.20	2.20	1.0	1030
Analysis Batch: 460-96407	Analysis Date: 12/19/2011 1130						DryWt Corrected: N

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

Pag

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Waste Characterization Quality Assurance Project Plan - Phase I Removal Action	WC02	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1WC-CS03	12/6/2011	13:30	Solid	Composite	19	X	X	X	X	X	X	X		X	X	X										MS/MSD (Note: No MS/MSD for Paint Filter Test)
PRR1WC-CS03	12/6/2011	13:30	Solid	Grab	6								X													

Requested Analyses	
1	Aroclor PCBs
2	Cyanide
3	Sulfide
4	Ignitability
5	Corrosivity
6	Paint Filter Test
7	TCLP SVOCs
8	TCLP VOCs
9	TCLP Pesticides
10	TCLP Chlorinated Herbicides
11	TCLP Metals
12	
13	
14	
15	
16	
17	
18	
19	
20	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica - Burlington, VT

Shipping Tracking # 795476006919

Specify Turnaround Requirements: Standard

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt: OK

Condition/Cooler Temp: 0.4

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	12/6/2011	1800					
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
			12/7/11 1140				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

12/22/2011

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1152 (200-9783)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #16267R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1152 (200-9783) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs/ HERB	MET	MISC
PRR1WATSMI-01	200-9783-01	Water	3/13/2012				X		X
PRR1WATSME-01	200-9783-02	Water	3/13/2012		X	X	X	X	X
PRR1WATSMI-02	200-9783-03	Water	3/13/2012				X		X
PRR1WATSME-02	200-9783-04	Water	3/13/2012		X	X	X	X	X
PRR1WATSMI-03	200-9783-05	Water	3/13/2012				X		X
PRR1WATSME-03	200-9783-06	Water	3/13/2012		X	X	X	X	X
TB03132012-01	200-9783-07	Water	3/13/2012		X				

Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
Volatiles, and Semivolatiles by USEPA SOM0.1.2.
Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate and bis(2-ethylhexyl) phthalate. These compounds were detected in the samples at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

The method blank exhibited concentrations less than the PQL for butylbenzylphthalate and bis(2-ethylhexyl) phthalate. These compounds were detected in the sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. The sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS/MSD determinations were performed on sample PRR1WATSME-03 for semivolatile analysis. All recoveries were observed within acceptable limits.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of trichloroethene, toluene, chlorobenzene, ethylbenzene, 1,3-dichlorobenzene, and 1,2,4-trichlorobenzene. Toluene was detected in sample location PRR1WATSME-02. The compounds were also detected in the trip blank. The concentrations are less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

MS/MSD analysis performed on sample location PRR1WATSME-03 exhibited a RPD greater than the control limit.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

The method blanks exhibited concentrations less than the PQL for trichloroethene, toluene, chlorobenzene, ethylbenzene, 1,3-dichlorobenzene, and 1,2,4-trichlorobenzene. These compounds were detected in trip blank, and toluene was detected in sample location PRR1WATSME-02 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. The toluene result for sample location PRR1WATSME-02 is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WATSME-03 for volatile analysis. All recoveries were observed within acceptable limits. The RPDs were greater than the control limit for all spiked compounds. The affected compounds were non-detect; qualification was not required.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The % difference (%D) between columns exceeded 100% for gamma-Chlordane that was detected at the reporting limit for sample location PRR1WATSME-01. The gamma-Chlordane sample result was flagged as estimated with possible interference.

Minor

The method blank exhibited low level concentrations of beta-BHC. This compound was detected in the sample at a concentration less than five times the method blank concentration; therefore, beta-BHC in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

The method blank exhibited concentrations less than the PQL for beta-BHC. This compound was detected in the samples at a concentration less than five times the method blank concentration; therefore, beta-BHC in the sample is most likely from laboratory contamination. The sample results for sample locations PRR1WATSME-02 and PRR1WATSME-03 are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1SOLIF-01 for pesticide analysis. All recoveries were observed within acceptable limits.

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATSME-01	alpha-BHC	338%
	Heptachlor	262%
	Aldrin	54.0%
	Dieldrin	79.9%

Sample Locations	Compound	%D
PRR1WATSME-01	4,4'-DDE	218%
	Endrin	372%
	4,4'-DDD	256%
	4,4'-DDT	117%
	Endrin aldehyde	65.6%
	gamma-Chlordane	453%
PRR1WATSME-02	Heptachlor	323%
	4,4'-DDE	174%
	4,4'-DDD	79.0%
	gamma-Chlordane	193%
PRR1WATSME-03	4,4'-DDE	53.4%
	4,4'-DDD	45.6%

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
>25% to 50%	J
>50% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

All pesticides, except gamma-Chlordane, that are flagged P will be qualified as non-detect at the RL for sample location PRR1WATSME-01. The gamma-Chlordane result will be qualified as estimated with possible interference (JN) due to the high %D.

All pesticides that are flagged P will be qualified as non-detect at the RL for sample location PRR1WATSME-02.

4,4'-DDE result for sample location PRR1WATSME-03 will be qualified as non-detect at the RL. The sample results for 4,4'-DDD will be qualified as estimated (J).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

MS and MSD determinations were performed on sample PRR1WATSME-03 for PCB analysis. All recoveries were observed within acceptable limits.

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

Dinoseb recoveries were less than 10% for the Laboratory Control Sample and the MS/MSD associated with the effluent samples. The samples were re-extracted with improved recoveries. Both sets of results are reported in the laboratory report. See Sections 4 and 5.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure

performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

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

Sample Locations	Compound	LCS Recovery
PRR1WATSME-01 PRR1WATSME-02 PRR1WATSME-03	Dinoseb	< 10%
PRR1WATSME-01 RA PRR1WATSME-02 RA PRR1WATSME-03 RA	Dinoseb	<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

The dinoseb sample results from the initial analysis are rejected. All sample results are reported from the re-extracted analysis.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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
PRR1WATSME-03	2,4-D	<LL but >10%	AC
	Dinoseb	<10%	<10%
PRR1WATSME-03 RA	2,4-D	<LL but >10%	AC
	Dinoseb	<LL but >10%	<LL but >10%

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	

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

Sample Locations	Compound
PRR1WATSME-03 RA	2,4-D
	2,4-DB
	Dinoseb

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contains re-extraction and re-analysis of the samples due to QC failures associated with dinoseb. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

Accuracy/Bias – The matrix spike recovery was less than 30% for cyanide, indicating potential low bias for non-detect results for the affected analyte in the associated samples. Project accuracy measurement performance criteria were not met for the affected analytes.

Minor

Matrix Interference – The serial dilution percent difference (%D) were greater than the acceptance limit for arsenic. Project accuracy measurement performance criteria were not met for the affected analytes.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

Sample PRR1WATSME-03 was selected for MS analysis. The result of this evaluation was that cyanide spike recovery was less than 30%, which is below the control limits (75-125%). The post spike was performed and the cyanide recovery was 88%, greater than the lower limit of 75%.

The observed recoveries for the analytes listed in the table below did not meet accuracy acceptance criteria, indicating potential low bias in associated samples. Project accuracy/bias measurement performance criteria were not met. Matrix spike recoveries and validation qualification are described in the following tables.

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
PRR1WATSME-03	Cyanide	21%

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
PRR1WATSME-03	Cyanide	21%	88%

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATSME-03 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all analytes met project measurement performance criteria.

6. SERIAL DILUTION

Sample PRR1WATSME-03 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria with the following exceptions. The observed %D for arsenic did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1WATSME-03	Arsenic	24%

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
> 10%	Non-detect	UJ
	Detect	J

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

3. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed on sample PRR1WATSME-03 for TOC analysis. Recoveries were observed within acceptable limits.

4. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATSME-03 was selected for the duplicate analysis for TOC and TSS. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

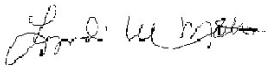
5. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: May 16, 2012

PEER REVIEW: Dennis Capria

DATE: June 8, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - PCBs

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ	PRR1WATSME-03	LQ	VQ
Aroclor-1016	ug/L	1.1	U	U	1	U	U	0.97	U	U
Aroclor-1242	ug/L	1.1	U	U	1	U	U	0.97	U	U
Aroclor-1254	ug/L	1.1	U	U	1	U	U	0.97	U	U
Aroclor-1260	ug/L	1.1	U	U	1	U	U	0.97	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - Pesticides

ANALYTE	Units	PRR1WATSME-01			PRR1WATSME-02			PRR1WATSME-03		
4,4'-DDD	ug/L	0.01	J P	U	0.0099	J P	U	0.00038	J P	J
4,4'-DDE	ug/L	0.01	J P	U	0.0099	J P	U	0.0096	J P	U
4,4'-DDT	ug/L	0.01	J P	U	0.0099	U	U	0.0096	U	U
Aldrin	ug/L	0.0052	J P	U	0.0049	U	U	0.0048	U	U
Alpha-BHC	ug/L	0.0052	J P	U	0.0004	J	J	0.0048	U	U
Alpha-Chlordane	ug/L	0.0052	U	U	0.0049	U	U	0.0048	U	U
Beta-BHC	ug/L	0.0052	U	U	0.0049	J P B	UB	0.0048	J P B	UB
Dieldrin	ug/L	0.01	J P	U	0.0099	U	U	0.0096	U	U
Endosulfan I	ug/L	0.0032	J	J	0.001	J	J	0.0048	U	U
Endosulfan II	ug/L	0.01	U	U	0.0099	U	U	0.0096	U	U
Endosulfan Sulfate	ug/L	0.01	U	U	0.0099	U	U	0.0096	U	U
Endrin	ug/L	0.01	J P	U	0.0099	U	U	0.0096	U	U
Endrin Aldehyde	ug/L	0.01	J P	U	0.0099	U	U	0.0096	U	U
Gamma-BHC (Lindane)	ug/L	0.0052	U	U	0.0049	U	U	0.0048	U	U
Gamma-Chlordane	ug/L	0.0052	P	JN	0.0049	J P	U	0.0048	U	U
Heptachlor	ug/L	0.0052	J P	U	0.0049	J P	U	0.0048	U	U
Heptachlor Epoxide	ug/L	0.0052	U	U	0.0049	U	U	0.0048	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - Herbicides

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ	PRR1WATSME-03	LQ	VQ
2,4-D	ug/L	1.8	U	U	1.9	U	U	1.8	U	UJ
2,4-DB	ug/L	1.6	U	U	1.7	U	U	1.6	U	UJ
Dinoseb	ug/L	0.92	U	UJ	0.94	U	UJ	0.9	U	UJ

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - Herbicides

ANALYTE	Units	PRR1WATSMI-01	LQ	VQ	PRR1WATSMI-02	LQ	VQ	PRR1WATSMI-03	LQ	VQ
2,4-D	ug/L	1.8			1.6	J	J	1.4	J	J
2,4-DB	ug/L	1.6	U	U	1.6	U	U	1.6	U	U
Dinoseb	ug/L	0.9	U	U	0.9	U	U	0.91	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - VOCs

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ	PRR1WATSME-03	LQ	VQ
1,1-Dichloroethene	ug/L	10	U	U	10	U	U	10	U	U
1,2,4-Trichlorobenzene	ug/L	10	U	U	10	U	U	10	U	U
1,2-Dichlorobenzene	ug/L	10	U	U	10	U	U	10	U	U
1,3-Dichlorobenzene	ug/L	10	U	U	10	U	U	10	U	U
1,4-Dichlorobenzene	ug/L	10	U	U	10	U	U	10	U	U
Benzene	ug/L	10	U	U	10	U	U	10	U	U
Chlorobenzene	ug/L	10	U	U	10	U	U	10	U	U
Chloroform	ug/L	10	U	U	10	U	U	10	U	U
Ethylbenzene	ug/L	10	U	U	10	U	U	10	U	U
Methylene Chloride	ug/L	10	U	U	10	U	U	10	U	U
Tetrachloroethene	ug/L	10	U	U	10	U	U	10	U	U
Toluene	ug/L	10	U	U	10	J B	UB	10	U	U
Trichloroethene	ug/L	10	U	U	10	U	U	10	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - SVOCs

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ	PRR1WATSME-03	LQ	VQ
2,4,6-Trichlorophenol	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
2,4-Dichlorophenol	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
2,4-Dimethylphenol	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
2-Chlorophenol	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Anthracene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Benzo(a)anthracene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Benzo(a)pyrene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Benzo(b)fluoranthene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Benzo(k)fluoranthene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
bis(2-Ethylhexyl)phthalate	ug/L	5.1	J B	UB	5.1	J B	UB	5.3	J B	UB
Butylbenzylphthalate	ug/L	5.1	J B	UB	5.1	J B	UB	5.3	J B	UB
Chrysene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Dibenzo(a,h)anthracene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Di-n-Butylphthalate	ug/L	0.12	J	J	0.15	J	J	0.14	J	J
Fluoranthene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Fluorene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Hexachlorobenzene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Hexachlorobutadiene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Indeno(1,2,3-cd)pyrene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Naphthalene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Pentachlorophenol	ug/L	10	U	U	10	U	U	11	U	U
Phenanthrene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Phenol	ug/L	5.1	U	U	5.1	U	U	5.3	U	U
Pyrene	ug/L	5.1	U	U	5.1	U	U	5.3	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - Inorganics

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ	PRR1WATSME-03	LQ	VQ
Antimony	ug/L	5.7			5.7			5.8		
Arsenic	ug/L	9.9	E	J	10.2	E	J	9.8	E	J
Beryllium	ug/L	1	U	U	1	U	U	1	U	U
Cadmium	ug/L	1	U	U	1	U	U	1	U	U
Chromium	ug/L	2.1			2.4			2.3		
Copper	ug/L	1.7	J	J	4.2			2.8		
Cyanide	ug/L	10	U N	UJ	10	U N	UJ	10	U N	UJ
Lead	ug/L	0.96	J	J	1.3			1		
Mercury	ug/L	0.2	U	U	0.2	U	U	0.2	U	U
Nickel	ug/L	1.9			1.8			1.9		
Selenium	ug/L	18.7			18.3			17.6		
Silver	ug/L	1	U	U	1	U	U	1	U	U
Zinc	ug/L	2	U	U	2	U	U	2	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - Miscellaneous

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ	PRR1WATSME-03	LQ	VQ
Total Organic Carbon	mg/L	2.6	B		2.5	B		2.4	B	
Total Suspended Solids	mg/L	15.5			17			15.6		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1152 - Miscellaneous

ANALYTE	Units	PRR1WATSMI-01	LQ	VQ	PRR1WATSMI-02	LQ	VQ	PRR1WATSMI-03	LQ	VQ
Total Organic Carbon	mg/L	NA			NA			NA		
Total Suspended Solids	mg/L	63.3			60			56.7		

SAMPLE ANALYSIS DATA SHEETS AND COCs

EPA SAMPLE NO.
PRR1WATSME-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-2

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MJDA14.D

Level: (TRACE/LOW/MED) LOW Date Received: 03/13/2012

% Moisture: not dec. Date Analyzed: 03/14/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 2.0

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
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
67-66-3	Chloroform	10	U
71-43-2	Benzene	10	U
79-01-6	Trichloroethene	10	U
108-88-3	Toluene	10	U
127-18-4	Tetrachloroethene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-4

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MJDA15.D

Level: (TRACE/LOW/MED) LOW Date Received: 03/13/2012

% Moisture: not dec. _____ Date Analyzed: 03/14/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 2.0

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
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
67-66-3	Chloroform	10	U
71-43-2	Benzene	10	U
79-01-6	Trichloroethene	10	U
108-88-3	Toluene	10 ~~0.075~~ ~~J B~~ UB	
127-18-4	Tetrachloroethene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATSME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-6

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MJDA16.D

Level: (TRACE/LOW/MED) LOW Date Received: 03/13/2012

% Moisture: not dec. Date Analyzed: 03/14/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 2.0

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
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	10	U
67-66-3	Chloroform	10	U
71-43-2	Benzene	10	U
79-01-6	Trichloroethene	10	U
108-88-3	Toluene	10	U
127-18-4	Tetrachloroethene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03132012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-7

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: MJDA05.D

Level: (TRACE/LOW/MED) LOW Date Received: 03/13/2012

% Moisture: not dec. Date Analyzed: 03/14/2012

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
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
67-66-3	Chloroform	5.0	U
71-43-2	Benzene	5.0	U
79-01-6	Trichloroethene	0.35	J B
108-88-3	Toluene	0.11	J B
127-18-4	Tetrachloroethene	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	0.099	J B
541-73-1	1,3-Dichlorobenzene	0.23	J B
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
120-82-1	1,2,4-Trichlorobenzene	0.38	J B

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-2

Sample wt/vol: 980 (g/mL) mL Lab File ID: RJSLW12.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/13/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/14/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
108-95-2	Phenol	5.1	U
95-57-8	2-Chlorophenol	5.1	U
105-67-9	2,4-Dimethylphenol	5.1	U
120-83-2	2,4-Dichlorophenol	5.1	U
91-20-3	Naphthalene	5.1	U
87-68-3	Hexachlorobutadiene	5.1	U
88-06-2	2,4,6-Trichlorophenol	5.1	U
86-73-7	Fluorene	5.1	U
118-74-1	Hexachlorobenzene	5.1	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.1	U
120-12-7	Anthracene	5.1	U
84-74-2	Di-n-butylphthalate	0.12	J
206-44-0	Fluoranthene	5.1	U
129-00-0	Pyrene	5.1	U
85-68-7	Butylbenzylphthalate	5.1 ~~0.19~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	5.1	U
218-01-9	Chrysene	5.1	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.1 ~~1.6~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	5.1	U
207-08-9	Benzo(k)fluoranthene	5.1	U
50-32-8	Benzo(a)pyrene	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.1	U
53-70-3	Dibenzo(a,h)anthracene	5.1	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-4

Sample wt/vol: 985 (g/mL) mL Lab File ID: RJSLW13.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: _____ Decanted: (Y/N) __ Date Received: 03/13/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/13/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/14/2012

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-95-2	Phenol	5.1	U
95-57-8	2-Chlorophenol	5.1	U
105-67-9	2,4-Dimethylphenol	5.1	U
120-83-2	2,4-Dichlorophenol	5.1	U
91-20-3	Naphthalene	5.1	U
87-68-3	Hexachlorobutadiene	5.1	U
88-06-2	2,4,6-Trichlorophenol	5.1	U
86-73-7	Fluorene	5.1	U
118-74-1	Hexachlorobenzene	5.1	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.1	U
120-12-7	Anthracene	5.1	U
84-74-2	Di-n-butylphthalate	0.15	J
206-44-0	Fluoranthene	5.1	U
129-00-0	Pyrene	5.1	U
85-68-7	Butylbenzylphthalate	5.1 ~~0.21~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	5.1	U
218-01-9	Chrysene	5.1	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.1 ~~1.6~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	5.1	U
207-08-9	Benzo(k)fluoranthene	5.1	U
50-32-8	Benzo(a)pyrene	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.1	U
53-70-3	Dibenzo(a,h)anthracene	5.1	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-6

Sample wt/vol: 940 (g/mL) mL Lab File ID: RJSLW14.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: _____ Decanted: (Y/N) __ Date Received: 03/13/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/13/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/14/2012

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-95-2	Phenol	5.3	U
95-57-8	2-Chlorophenol	5.3	U
105-67-9	2,4-Dimethylphenol	5.3	U
120-83-2	2,4-Dichlorophenol	5.3	U
91-20-3	Naphthalene	5.3	U
87-68-3	Hexachlorobutadiene	5.3	U
88-06-2	2,4,6-Trichlorophenol	5.3	U
86-73-7	Fluorene	5.3	U
118-74-1	Hexachlorobenzene	5.3	U
87-86-5	Pentachlorophenol	11	U
85-01-8	Phenanthrene	5.3	U
120-12-7	Anthracene	5.3	U
84-74-2	Di-n-butylphthalate	0.14	J
206-44-0	Fluoranthene	5.3	U
129-00-0	Pyrene	5.3	U
85-68-7	Butylbenzylphthalate	5.3 ~~0.18~~	~~J B~~ UB
56-55-3	Benzo(a)anthracene	5.3	U
218-01-9	Chrysene	5.3	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.3 ~~1.5~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	5.3	U
207-08-9	Benzo(k)fluoranthene	5.3	U
50-32-8	Benzo(a)pyrene	5.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.3	U
53-70-3	Dibenzo(a,h)anthracene	5.3	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-2

Sample wt/vol: 965 (g/mL) mL Lab File ID: 14MA120949-R051.D

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Extraction: (Type) SEPF Date Extracted: 03/13/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q	
319-84-6	alpha-BHC	0.0052 ~~0.0028~~	~~J P~~	U
319-85-7	beta-BHC	0.0052	U	
58-89-9	gamma-BHC (Lindane)	0.0052	U	
76-44-8	Heptachlor	0.0052 ~~0.0035~~	~~J P~~	U
309-00-2	Aldrin	0.0052 ~~0.00099~~	~~J P~~	U
1024-57-3	Heptachlor epoxide	0.0052	U	
959-98-8	Endosulfan I	0.0032	J	
60-57-1	Dieldrin	0.010 ~~0.0014~~	~~J P~~	U
72-55-9	4,4'-DDE	0.010 ~~0.00098~~	~~J P~~	U
72-20-8	Endrin	0.010 ~~0.0010~~	~~J P~~	U
33213-65-9	Endosulfan II	0.010	U	
72-54-8	4,4'-DDD	0.010 ~~0.00056~~	~~J P~~	U
1031-07-8	Endosulfan sulfate	0.010	U	
50-29-3	4,4'-DDT	0.010 ~~0.0012~~	~~J P~~	U
7421-93-4	Endrin aldehyde	0.010 ~~0.00093~~	~~J P~~	U
5103-71-9	alpha-Chlordane	0.0052	U	
5103-74-2	gamma-Chlordane	0.0052	~~J~~ JN	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-4

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 14MA120949-R061.D

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Extraction: (Type) SEPF Date Extracted: 03/13/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.00040	J
319-85-7	beta-BHC	0.0049 ~~0.00096~~	~~J P B~~ UB
58-89-9	gamma-BHC (Lindane)	0.0049	U
76-44-8	Heptachlor	0.0049 ~~0.00081~~	~~J P~~ U
309-00-2	Aldrin	0.0049	U
1024-57-3	Heptachlor epoxide	0.0049	U
959-98-8	Endosulfan I	0.0010	J
60-57-1	Dieldrin	0.0099	U
72-55-9	4,4'-DDE	0.0099 ~~0.00046~~	~~J P~~ U
72-20-8	Endrin	0.0099	U
33213-65-9	Endosulfan II	0.0099	U
72-54-8	4,4'-DDD	0.0099 ~~0.00044~~	~~J P~~ U
1031-07-8	Endosulfan sulfate	0.0099	U
50-29-3	4,4'-DDT	0.0099	U
7421-93-4	Endrin aldehyde	0.0099	U
5103-71-9	alpha-Chlordane	0.0049	U
5103-74-2	gamma-Chlordane	0.0049 ~~0.00033~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-6

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 14MA120949-R071.D

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Extraction: (Type) SEPF Date Extracted: 03/13/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.0048	U
319-85-7	beta-BHC	0.0048 ~~0.00082~~	~~J P B~~ UB
58-89-9	gamma-BHC (Lindane)	0.0048	U
76-44-8	Heptachlor	0.0048	U
309-00-2	Aldrin	0.0048	U
1024-57-3	Heptachlor epoxide	0.0048	U
959-98-8	Endosulfan I	0.0048	U
60-57-1	Dieldrin	0.0096	U
72-55-9	4,4'-DDE	0.0096 ~~0.00038~~	~~J P~~ U
72-20-8	Endrin	0.0096	U
33213-65-9	Endosulfan II	0.0096	U
72-54-8	4,4'-DDD	0.00038	J P
1031-07-8	Endosulfan sulfate	0.0096	U
50-29-3	4,4'-DDT	0.0096	U
7421-93-4	Endrin aldehyde	0.0096	U
5103-71-9	alpha-Chlordane	0.0048	U
5103-74-2	gamma-Chlordane	0.0048	U

EPA SAMPLE NO.
PRR1WATSME-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-2

Sample wt/vol: 870 (g/mL) mL Lab File ID: 14MA120829-R071.D

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Extraction: (Type) SEPF Date Extracted: 03/13/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	1.1	U
53469-21-9	Aroclor-1242	1.1	U
11097-69-1	Aroclor-1254	1.1	U
11096-82-5	Aroclor-1260	1.1	U

EPA SAMPLE NO.
PRR1WATSME-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-4

Sample wt/vol: 960 (g/mL) mL Lab File ID: 14MA120829-R081.D

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Extraction: (Type) SEPF Date Extracted: 03/13/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	1.0	U
53469-21-9	Aroclor-1242	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

EPA SAMPLE NO.
PRR1WATSME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1152

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9783-6

Sample wt/vol: 1030 (g/mL) mL Lab File ID: 14MA120829-R091.D

% Moisture: Decanted: (Y/N) Date Received: 03/13/2012

Extraction: (Type) SEPF Date Extracted: 03/13/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.97	U
53469-21-9	Aroclor-1242	0.97	U
11097-69-1	Aroclor-1254	0.97	U
11096-82-5	Aroclor-1260	0.97	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-01 Lab Sample ID: 200-9783-2

Matrix: Water Lab File ID: 14ma121608-r031.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:10

Extraction Method: 8151A Date Extracted: 03/14/2012 10:30

Sample wt/vol: 985(mL) Date Analyzed: 03/14/2012 23:38

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35037 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.9	U	1.9	0.66
94-82-6	2,4-DB	1.7	U	1.7	0.48

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	76		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-01 Lab Sample ID: 200-9783-2

Matrix: Water Lab File ID: 14ma121608-r031.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:10

Extraction Method: 8151A Date Extracted: 03/14/2012 10:30

Sample wt/vol: 985(mL) Date Analyzed: 03/14/2012 23:38

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35037 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
88-85-7	Dinoseb	~~0.96~~	~~U~~ R	0.96	0.19

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	78		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-01 RA Lab Sample ID: 200-9783-2 RA

Matrix: Water Lab File ID: 16ma120750-r111.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:10

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1035(mL) Date Analyzed: 03/16/2012 13:47

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	*2,4-D*	*1.8*	*U*	*1.8*	*0.63*
94-82-6	*2,4-DB*	*1.6*	*U*	*1.6*	*0.45*
88-85-7	*Dinoseb*	*0.92*	*U J*	*0.92*	*0.18*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	91		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-02 | Lab Sample ID: 200-9783-4

Matrix: Water | Lab File ID: 14ma121608-r041.d

Analysis Method: 8151A | Date Collected: 03/13/2012 04:30

Extraction Method: 8151A | Date Extracted: 03/14/2012 10:30

Sample wt/vol: 980(mL) | Date Analyzed: 03/15/2012 00:13

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 35037 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.9	U	1.9	0.66
94-82-6	2,4-DB	1.7	U	1.7	0.48
88-85-7	Dinoseb	0.97	U *	0.97	0.19

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	91		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-02 RA Lab Sample ID: 200-9783-4 RA

Matrix: Water Lab File ID: 16ma120750-r121.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:30

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1015(mL) Date Analyzed: 03/16/2012 14:23

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	*2,4-D*	*1.9*	*U*	*1.9*	*0.64*
94-82-6	*2,4-DB*	*1.7*	*U*	*1.7*	*0.46*
88-85-7	*Dinoseb*	*0.94*	*U J*	*0.94*	*0.19*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	88		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-03 | Lab Sample ID: 200-9783-6

Matrix: Water | Lab File ID: 14ma121608-r051.d

Analysis Method: 8151A | Date Collected: 03/13/2012 05:00

Extraction Method: 8151A | Date Extracted: 03/14/2012 10:30

Sample wt/vol: 945(mL) | Date Analyzed: 03/15/2012 00:47

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 35037 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	2.0	U	2.0	0.69
94-82-6	2,4-DB	1.8	U	1.8	0.50
88-85-7	Dinoseb	1.0	U *	1.0	0.20

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	91		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG No.: PRR1152

Client Sample ID: PRR1WATSME-03 RA Lab Sample ID: 200-9783-6 RA

Matrix: Water Lab File ID: 16mal20750-r131.d

Analysis Method: 8151A Date Collected: 03/13/2012 05:00

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1055(mL) Date Analyzed: 03/16/2012 14:58

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	*2,4-D*	*1.8*	*U J*	*1.8*	*0.62*
94-82-6	*2,4-DB*	*1.6*	*U J*	*1.6*	*0.45*
88-85-7	*Dinoseb*	*0.90*	*U J*	*0.90*	*0.18*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	67		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-3

SDG No.: PRR1152

Client Sample ID: PRR1WATSMI-01 Lab Sample ID: 200-9783-1

Matrix: Water Lab File ID: 16ma120750-r171.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:00

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1055(mL) Date Analyzed: 03/16/2012 17:20

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.6	U	1.6	0.45
88-85-7	Dinoseb	0.90	U	0.90	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	94		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-3

SDG No.: PRR1152

Client Sample ID: PRR1WATSMI-01 Lab Sample ID: 200-9783-1

Matrix: Water Lab File ID: 16ma120750-r171.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:00

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1055(mL) Date Analyzed: 03/16/2012 17:20

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.8		1.8	0.62

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	99		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-3

SDG No.: PRR1152

Client Sample ID: PRR1WATSMI-02 Lab Sample ID: 200-9783-3

Matrix: Water Lab File ID: 16ma120750-r181.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:20

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1055(mL) Date Analyzed: 03/16/2012 17:56

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.6	U	1.6	0.45
88-85-7	Dinoseb	0.90	U	0.90	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	88		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-3

SDG No.: PRR1152

Client Sample ID: PRR1WATSMI-02 Lab Sample ID: 200-9783-3

Matrix: Water Lab File ID: 16ma120750-r181.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:20

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1055(mL) Date Analyzed: 03/16/2012 17:56

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.6	J	1.8	0.62

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	99		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-3

SDG No.: PRR1152

Client Sample ID: PRR1WATSMI-03 Lab Sample ID: 200-9783-5

Matrix: Water Lab File ID: 16ma120750-r191.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:45

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1045(mL) Date Analyzed: 03/16/2012 18:31

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.6	U	1.6	0.45
88-85-7	Dinoseb	0.91	U	0.91	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	81		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9783-3

SDG No.: PRR1152

Client Sample ID: PRR1WATSMI-03 Lab Sample ID: 200-9783-5

Matrix: Water Lab File ID: 16ma120750-r191.d

Analysis Method: 8151A Date Collected: 03/13/2012 04:45

Extraction Method: 8151A Date Extracted: 03/15/2012 18:09

Sample wt/vol: 1045(mL) Date Analyzed: 03/16/2012 18:31

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35148 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.4	J	1.8	0.62

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	87		60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-2
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	5.7			MS
7440-38-2	Arsenic	9.9		J B	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.1			MS
7440-50-8	Copper	1.7	J		MS
7439-92-1	Lead	0.96	J		MS
7440-02-0	Nickel	1.9			MS
7782-49-2	Selenium	18.7			MS
7440-22-4	Silver	1.0	U		MS
7440-66-6	Zinc	2.0	U		MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-2
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-2
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U	J N	AS

Color Before: COLORLESS Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-4
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	5.7			MS
7440-38-2	Arsenic	10.2		J B	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.4			MS
7440-50-8	Copper	4.2			MS
7439-92-1	Lead	1.3			MS
7440-02-0	Nickel	1.8			MS
7782-49-2	Selenium	18.3			MS
7440-22-4	Silver	1.0	U		MS
7440-66-6	Zinc	2.0	U		MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-4
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-4
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U	J N	AS

Color Before: COLORLESS Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-6
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	5.8			MS
7440-38-2	Arsenic	9.8		J E	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.3			MS
7440-50-8	Copper	2.8			MS
7439-92-1	Lead	1.0			MS
7440-02-0	Nickel	1.9			MS
7782-49-2	Selenium	17.6			MS
7440-22-4	Silver	1.0	U		MS
7440-66-6	Zinc	2.0	U		MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-6
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1152
Matrix: WATER Lab Sample Id: 200-9783-6
% Solids: Date Received: 03/13/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U	J	AS

Color Before: COLORLESS Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSMI-01 Lab Sample ID: 200-9783-1

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:00

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	63.3	8.3		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-01 Lab Sample ID: 200-9783-2

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:10

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	2.6	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-01 Lab Sample ID: 200-9783-2

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:10

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.5	2.5		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSMI-02 Lab Sample ID: 200-9783-3

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:20

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	60.0	8.3		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-02 Lab Sample ID: 200-9783-4

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:30

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	2.5	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-02 Lab Sample ID: 200-9783-4

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:30

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	17.0	2.5		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSMI-03 Lab Sample ID: 200-9783-5

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 04:45

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	56.7	8.3		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-03 Lab Sample ID: 200-9783-6

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 05:00

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	2.4	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-03 Lab Sample ID: 200-9783-6

Lab Name: TestAmerica Burlington Job No.: 200-9783-2

SDG ID.: PRR1152

Matrix: Water Date Sampled: 03/13/2012 05:00

Reporting Basis: WET Date Received: 03/13/2012 13:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.6	2.0		mg/L			1	SM 2540D

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1152	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATSMI-01	3/13/2012	4:00	water	Grab	15	X	H	H	H	H	H	H											
PRR1WATSME-01	3/13/2012	4:10	water	Grab	15	X	X	X	X	X	X	X											
PRR1WATSMI-02	3/13/2012	4:20	water	Grab	15	X	H	H	H	H	H	H											
PRR1WATSME-02	3/13/2012	4:30	water	Grab	15	X	X	X	X	X	X	X											
PRR1WATSMI-03	3/13/2012	4:45	water	Grab	15	X	H	H	H	H	H	H											
PRR1WATSME-03	3/13/2012	5:00	water	Grab	45	X	X	X	X	X	X	X											MS and MSD
TB03132012	3/13/2012	-	water	grab - QC	3				X														

Requested Analyses	
1	TSS
2	TOC
3	SVOCs (See Wksht #15-2 in RAWP QAPP)
4	VOCs (See Wksht #15-2 in RAWP QAPP)
7	Aroclor PCBs (See Wksht #15-2 in RAWP QAPP)
5	Metals + Cyanide (See Wksht #15-2 in RAWP QAPP)
6	Herbicides (See Wksht #15-2 in RAWP QAPP)
7	Pesticides (See Wksht #15-2 in RAWP QAPP)
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

48 hr TAT

X: Analyze Now H: Please HOLD sample

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 48 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	3/13/2012		TABVL 03/13/12 1350			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1152 (33653)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #16268R
Project: B0009964.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PR1152 (33653) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	PEST	PCBs	PCDD/ PCDF	MISC
PRR1WATSME-01	33653-002	Water	3/13/2012					X	
PRR1WATSME-02	33653-004	Water	3/13/2012					X	
PRR1WATSME-03	33653-006	Water	3/13/2012					X	

1. PCDD/PCDF – Dioxins/Furans by USEPA 1613
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location PRR1WATSME-03.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was not detected in samples; therefore, confirmation analysis was not required.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

An MS and MSD were performed on sample PRR1WATSME-03 for PCDD/PCDF analysis. Upon evaluation, precision and accuracy indicators were favorable in all cases.

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

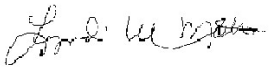
Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: May 16, 2012

PEER REVIEW BY: Dennis Capria

DATE: June 8, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1152 - Dioxins/Furans

ANALYTE	Units	PRR1WATSME-01	LQ	VQ	PRR1WATSME-02	LQ	VQ
2,3,7,8-TCDD	pg/L	4.94	EMPC	EMPC	5.66		
1,2,3,7,8-PeCDD	pg/L	0.819	U	U	0.842	U	U
1,2,3,4,7,8-HxCDD	pg/L	1.73	U	U	1.32	U	U
1,2,3,6,7,8-HxCDD	pg/L	1.97	U	U	1.53	U	U
1,2,3,7,8,9-HxCDD	pg/L	2.11	U	U	1.6	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	7.83	J	J	8.46	J	J
OCDD	pg/L	64.2			83.3		
2,3,7,8-TCDF	pg/L	1.2	J	J	1.55	J	J
1,2,3,7,8-PeCDF	pg/L	0.763	U	U	0.795	U	U
2,3,4,7,8-PeCDF	pg/L	0.755	U	U	0.743	U	U
1,2,3,4,7,8-HxCDF	pg/L	1.7	EMPC	EMPC	2.55	J	J
1,2,3,6,7,8-HxCDF	pg/L	0.773	U	U	0.826	U	U
1,2,3,7,8,9-HxCDF	pg/L	1.26	U	U	1.42	U	U
2,3,4,6,7,8-HxCDF	pg/L	0.901	U	U	1.03	U	U
1,2,3,4,6,7,8-HpCDF	pg/L	12.9	J	J	13.6	J	J
1,2,3,4,7,8,9-HpCDF	pg/L	1.22	U	U	2.34	U	U
OCDF	pg/L	16.3	J	J	21.1	J	J
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	6.44			7.26		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1152 - Dioxins/Furans

ANALYTE	Units	PRR1WATSME-03	LQ	VQ
2,3,7,8-TCDD	pg/L	5.25		
1,2,3,7,8-PeCDD	pg/L	1.07	U	U
1,2,3,4,7,8-HxCDD	pg/L	1.53	U	U
1,2,3,6,7,8-HxCDD	pg/L	1.71	U	U
1,2,3,7,8,9-HxCDD	pg/L	1.81	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	8.94	J	J
OCDD	pg/L	79.1		
2,3,7,8-TCDF	pg/L	1.13	EMPC	EMPC
1,2,3,7,8-PeCDF	pg/L	0.845	U	U
2,3,4,7,8-PeCDF	pg/L	0.833	U	U
1,2,3,4,7,8-HxCDF	pg/L	2.29	EMPC	EMPC
1,2,3,6,7,8-HxCDF	pg/L	0.971	U	U
1,2,3,7,8,9-HxCDF	pg/L	1.57	U	U
2,3,4,6,7,8-HxCDF	pg/L	1.11	U	U
1,2,3,4,6,7,8-HpCDF	pg/L	13.6	J	J
1,2,3,4,7,8,9-HpCDF	pg/L	2.15	U	U
OCDF	pg/L	19.3	J	J
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	6.97		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: **PRR1WATSME-01** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33653-002	Date Received:	13-Mar-12
Project:	PRR1152	Sample Size:	1.00 L	QC Batch No.:	4314	Date Extracted:	13-Mar-12
Date Collected:	13-Mar-12			Date Analyzed DB-5:	14-Mar-12	Date Analyzed DB-225:	NA
Time Collected:	0410						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND		4.94	
1,2,3,7,8-PeCDD	ND	0.819		
1,2,3,4,7,8-HxCDD	ND	1.73		
1,2,3,6,7,8-HxCDD	ND	1.97		
1,2,3,7,8,9-HxCDD	ND	2.11		
1,2,3,4,6,7,8-HpCDD	7.83			J
OCDD	64.2			
2,3,7,8-TCDF	1.20			J
1,2,3,7,8-PeCDF	ND	0.763		
2,3,4,7,8-PeCDF	ND	0.755		
1,2,3,4,7,8-HxCDF	ND		1.70	
1,2,3,6,7,8-HxCDF	ND	0.773		
2,3,4,6,7,8-HxCDF	ND	0.901		
1,2,3,7,8,9-HxCDF	ND	1.26		
1,2,3,4,6,7,8-HpCDF	12.9			J
1,2,3,4,7,8,9-HpCDF	ND	1.22		
OCDF	16.3			J

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	101	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	103	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	96.0	28 - 130	
	13C-1,2,3,4,6,7,8-HpCDD	94.8	23 - 140	
	13C-OCDD	90.0	17 - 157	
	13C-2,3,7,8-TCDF	94.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	92.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	92.4	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	90.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	92.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.6	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	88.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	91.8	26 - 138	
	13C-OCDF	86.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	102	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.351

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Rose Harrelson 15-Mar-2012 10:01

Sample ID: **PRR1WATSME-02** **EPA Method 1613**

Client Data
Name: ARCADIS U.S., Inc.
Project: PRR1152
Date Collected: 13-Mar-12
Time Collected: 0430

Sample Data
Matrix: Aqueous
Sample Size: 1.00 L

Laboratory Data
Lab Sample: 33653-004
QC Batch No.: 4314
Date Analyzed DB-5: 15-Mar-12
Date Received: 13-Mar-12
Date Extracted: 13-Mar-12
Date Analyzed DB-225: NA

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	5.66			
1,2,3,7,8-PeCDD	ND	0.842		
1,2,3,4,7,8-HxCDD	ND	1.32		
1,2,3,6,7,8-HxCDD	ND	1.53		
1,2,3,7,8,9-HxCDD	ND	1.60		
1,2,3,4,6,7,8-HpCDD	8.46			J
OCDD	83.3			
2,3,7,8-TCDF	1.55			J
1,2,3,7,8-PeCDF	ND	0.795		
2,3,4,7,8-PeCDF	ND	0.743		
1,2,3,4,7,8-HxCDF	2.55			J
1,2,3,6,7,8-HxCDF	ND	0.826		
2,3,4,6,7,8-HxCDF	ND	1.03		
1,2,3,7,8,9-HxCDF	ND	1.42		
1,2,3,4,6,7,8-HpCDF	13.6			J
1,2,3,4,7,8,9-HpCDF	ND	2.34		
OCDF	21.1			J

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	89.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	93.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	94.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	92.9	28 - 130	
	13C-1,2,3,4,6,7,8-HpCDD	88.1	23 - 140	
	13C-OCDD	83.9	17 - 157	
	13C-2,3,7,8-TCDF	88.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	84.5	24 - 185	
	13C-2,3,4,7,8-PeCDF	87.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	89.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	84.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	87.2	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	85.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	84.3	26 - 138	
	13C-OCDF	79.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **6.32**

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.
e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Rose Harrelson 15-Mar-2012 10:01

Sample ID: **PRR1WATSME-03** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33653-006	Date Received:	13-Mar-12
Project:	PRR1152	Sample Size:	0.961 L	QC Batch No.:	4314	Date Extracted:	13-Mar-12
Date Collected:	13-Mar-12			Date Analyzed DB-5:	15-Mar-12	Date Analyzed DB-225:	NA
Time Collected:	0500						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	5.25			
1,2,3,7,8-PeCDD	ND	1.07		
1,2,3,4,7,8-HxCDD	ND	1.53		
1,2,3,6,7,8-HxCDD	ND	1.71		
1,2,3,7,8,9-HxCDD	ND	1.81		
1,2,3,4,6,7,8-HpCDD	8.94			J
OCDD	79.1			
2,3,7,8-TCDF	ND		1.13	
1,2,3,7,8-PeCDF	ND	0.845		
2,3,4,7,8-PeCDF	ND	0.833		
1,2,3,4,7,8-HxCDF	ND		2.29	
1,2,3,6,7,8-HxCDF	ND	0.971		
2,3,4,6,7,8-HxCDF	ND	1.11		
1,2,3,7,8,9-HxCDF	ND	1.57		
1,2,3,4,6,7,8-HpCDF	13.6			J
1,2,3,4,7,8,9-HpCDF	ND	2.15		
OCDF	19.3			J

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	93.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	92.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	92.7	28 - 130	
	13C-1,2,3,4,6,7,8-HpCDD	87.6	23 - 140	
	13C-OCDD	85.0	17 - 157	
	13C-2,3,7,8-TCDF	88.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	86.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	87.0	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	84.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	86.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	87.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	81.9	26 - 138	
	13C-OCDF	78.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	103	35 - 197	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **5.50**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: FEB

Approved By: Rose Harrelson 15-Mar-2012 10:01

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33653 3.5°C 3.9°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1152	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1WATSMI-01	3/13/2012	4:00	water	Grab	2	H																				
PRR1WATSME-01	3/13/2012	4:10	water	Grab	2	X																				
PRR1WATSMI-02	3/13/2012	4:20	water	Grab	2	H																				
PRR1WATSME-02	3/13/2012	4:30	water	Grab	2	X																				
PRR1WATSMI-03	3/13/2012	4:45	water	Grab	2	H																				
PRR1WATSME-03	3/13/2012	5:00	water	Grab	6	X																				MS and MSD

Requested Analyses	
1	Dioxins (17 isomers)
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

48 hr TAT

X: Analyze Now H: Please HOLD sample

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista (El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 48 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Kavin Gandhi	3/13/2012		Bethria Benedict for TOM HORNER	@ 3/13/12	2102	(3/14/12 0752)	
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1335 (200-11115)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #16599R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1335 (200-11115) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATCME-61	200-11115-1	Water	6/4/2012						X
PRR1WATCME-60	200-11115-2	Water	6/2/2012		X	X	X	X	X
PRR1WATCME-59	200-11115-3	Water	6/1/2012						X
TB06042012	200-11115-4	Water	6/4/2012		X				

Miscellaneous parameters include Total Suspended Solids (TSS)
PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
Volatiles, and Semivolatiles by USEPA SOM0.1.2.
Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited a concentration greater than the PQL for phenol. Phenol was detected in the sample at concentrations less than the PQL; therefore, phenol in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

The method blank exhibited concentration greater than the PQL for phenol. This compound was detected in the sample at concentrations less than the PQL; therefore, phenol in the sample is most likely from laboratory contamination. The sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCME-60	Phenol-d5	D
	Bis(2-chloroethyl)ether-d8	D
	2-Chlorophenol-d4	D
	4-Methylphenol-d8	D
	Nitrobenzene-d5	D
	2-Nitrophenol-d4	D
	2,4-Dichlorophenol-d3	D
	4-Chloroaniline-d4	D
	Dimethylphthalate-d6	D
	Acenapthylene-d8	D
	4-Nitrophenol-d4	D
	Fluorene-d10	D
	4,6-Dinitro-2-methylphenol-d2	D
	Anthracene-d10	D
	Pyrene-d10	D
	Benzo(a)pyrene-d12	D

Diluted (D)

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	UJ[1]
	Detect	J[1]

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample

and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction and re-analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

Sample location PRR1WATCME-60 was analyzed at a dilution to achieve target compounds within the calibration range. The reporting limits are elevated due to the diluted analysis.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of methylene chloride, carbon tetrachloride, and toluene. The holding blank exhibited low level concentrations of chloromethane, methylene chloride, chloroform, carbon tetrachloride and toluene. These compounds were detected in sample location PRR1WATCME-60. Methylene chloride and carbon tetrachloride were also detected in the trip blank. See Section 2 for qualification of sample results due to contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

The method blanks exhibited concentrations less than the PQL for methylene chloride, carbon tetrachloride, and toluene. The holding blank also exhibited concentrations less than the PQL for chloromethane, methylene chloride, chloroform, carbon tetrachloride and toluene. Methylene chloride and carbon tetrachloride were also detected in the trip blank.

Chloromethane and carbon tetrachloride were detected in sample location PRR1WATCME-60 at concentrations less than the PQL; therefore, these compounds that were detected in the sample are presumed to be laboratory contamination. The chloromethane and carbon tetrachloride results for sample location PRR1WATCME-60 are reported at the PQL and flagged UB indicating non-detect due to laboratory contamination.

Methylene chloride, chloroform and toluene were detected in for sample location PRR1WATCME-60 at concentrations greater than the PQL. Therefore, detected sample results were not associated with laboratory contamination and resulted in the removal of the laboratory qualifier (B).

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCME-60	Vinyl chloride-d3	AC
	Chloroethane-d5	AC
	1,1-Dichloroethene-d2	AC
	2-Butanone-d5	AC
	Chloroform-d	> UL
	1,2-Dichloroethane-d4	AC
	Benzene-d6	AC
	1,2-Dichloropropane-d6	AC
	Toluene-d8	AC
	trans-1,3-Dichloropropene-d4	AC
	2-Hexanone-d5	> UL
	1,1,2,2-Tetrachloroethane-d2	AC
	1,2-Dichlorobenzene-d4	AC

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 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 > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

The compounds 1,1-dichloroethane and chloroform are qualified as estimated due to the chloroform-d surrogate recovery above control limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction or re-analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

Sample location PRR1WATCME-60 was analyzed at a dilution to achieve target compounds within the calibration range. The reporting limits are elevated due to the diluted analysis.

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
PRR1WATCME-60	Methylene chloride	180 E	150 D	150 D
	2-Butanone	2400 E	2000 D	2000 D
	Chloroform	73 E	66 D	66 D
	Benzene	200 E	170 D	170 D

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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC. This compound was detected in the sample at a concentration greater than the PQL. See Section 2 below.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

The method blank exhibited concentrations less than the PQL for beta-BHC. This compound was detected in the sample at a concentration greater than the PQL. Therefore, the detected sample result was not associated with blank contamination and resulted in the removal of the laboratory qualifier (B).

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-60	2,4'-DDE	33.7%
	2,4'-DDT	34.2%
	2,4'-DDD	35.8%
	Heptachlor	219%
	Heptachlor epoxide	>1000%
	Endosulfan I	70.5%

Sample Locations	Compound	%D
	Endrin	101.5%
	Endrin aldehyde	282%

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
>25% to 50%	J
>50% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCME-60	2,4-Dichlorophenylacetic Acid	D

Diluted (D)

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 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	UJ[1]
	Detect	J[1]

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicides were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

Sample location PRR1WATCME-60 was analyzed at a dilution to achieve target compounds within the calibration range. The reporting limits are elevated due to the diluted analysis

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Bias – Method blank exhibited a concentration less than the PQL for chromium. The sample concentration was greater than five times the method blank result. Therefore, detected sample results were not associated with blank contamination.

Accuracy - The LCS recoveries for antimony, beryllium, cadmium and nickel were slightly above the control limits of 80-120%. Project accuracy measurement performance criteria were not met for the affected analytes.

Matrix Interference – The serial dilution percent difference (%D) were greater than the acceptance limit for arsenic and nickel. Project accuracy measurement performance criteria were not met for the affected analytes.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

The method blank exhibited a concentration less than the PQL for chromium. The sample concentration was greater than five times the method blank result. Therefore, detected sample results were not associated with blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

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

Sample Locations	Compound	LCS Recovery
PRR1WATCME-60	Antimony	121%
	Beryllium	122%
	Cadmium	124%
	Nickel	121%

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

4. MATRIX SPIKE (MS)

An MS analysis is generated to determine the accuracy of the analytical procedure in a given matrix.

An MS analysis was performed on sample PRR1WATCME-60 for ICP-MS metals analysis. Upon evaluation precision and accuracy indicators were favorable.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATCME-60 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all analytes met project measurement performance criteria.

6. SERIAL DILUTION

Sample PRR1WATCME-60 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria with the following exceptions.

The observed %D for arsenic and nickel did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1WATCME-60	Arsenic	13%
	Nickel	11%

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
> 10%	Non-detect	UJ
	Detect	J

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

3. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

A MS was not performed on a sample location associated with this SDG.

4. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location associated with this SDG.

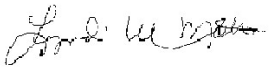
5. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: July 1, 2012

PEER REVIEW: Dennis Capria

DATE: July 2, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - PCBs

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
Aroclor-1016	ug/L	0.95	U	U
Aroclor-1221	ug/L	0.95	U	U
Aroclor-1232	ug/L	0.95	U	U
Aroclor-1242	ug/L	0.95	U	U
Aroclor-1248	ug/L	0.95	U	U
Aroclor-1254	ug/L	0.95	U	U
Aroclor-1260	ug/L	0.95	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - Pesticides

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
2,4'-DDD	ug/L	0.027	P	J
2,4'-DDE	ug/L	0.087	P	J
2,4'-DDT	ug/L	0.022	P	J
4,4'-DDD	ug/L	0.079		
4,4'-DDE	ug/L	0.018		
4,4'-DDT	ug/L	0.13		
Aldrin	ug/L	0.0048	U	U
Alpha-BHC	ug/L	0.0077		
Alpha-Chlordane	ug/L	0.0048	U	U
Beta-BHC	ug/L	0.028	B	
Delta-BHC	ug/L	0.0048	U	U
Dieldrin	ug/L	0.0095	U	U
Endosulfan I	ug/L	0.01	P	JN
Endosulfan II	ug/L	0.0086	J	J
Endosulfan Sulfate	ug/L	0.0095	U	U
Endrin	ug/L	0.0095	J P	U
Endrin Aldehyde	ug/L	0.0095	J P	U
Gamma-BHC (Lindane)	ug/L	0.0048	U	U
Gamma-Chlordane	ug/L	0.0048	U	U
Heptachlor	ug/L	0.0048	J P	U
Heptachlor Epoxide	ug/L	0.0048	J P	U
Toxaphene	ug/L	0.48	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - Herbicides

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
2,4,5-T	ug/L	6500		J
2,4-D	ug/L	210000		J
2,4-DB	ug/L	16000	U	UJ
Dinoseb	ug/L	9100	U	UJ

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - VOCs

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	U
1,1,2-Trichloroethane	ug/L	1	U	U
1,1-Dichloroethane	ug/L	0.093	J	J
1,1-Dichloroethene	ug/L	1	U	U
1,2,3-Trichlorobenzene	ug/L	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U
1,2-Dichlorobenzene	ug/L	1	U	U
1,2-Dichloroethane	ug/L	11		
1,2-Dichloropropane	ug/L	17		
1,3-Dichlorobenzene	ug/L	1	U	U
1,4-Dichlorobenzene	ug/L	1	U	U
2-Butanone	ug/L	2000	D	D
Acrolein	ug/L	20	U	U
Acrylonitrile	ug/L	20	U	U
Benzene	ug/L	170	D	D
Bromodichloromethane	ug/L	1	U	U
Bromoform	ug/L	1	U	U
Bromomethane	ug/L	1	U	U
Carbon Tetrachloride	ug/L	1	J B	UB
Chlorobenzene	ug/L	36		
Chloroethane	ug/L	0.71	J	J
Chloroform	ug/L	66	D	DJ
Chloromethane	ug/L	1	J	UB
cis-1,3-Dichloropropene	ug/L	1	U	U
Dibromochloromethane	ug/L	1	U	U
Ethylbenzene	ug/L	1	U	U
Methylene Chloride	ug/L	150	D B	D
Tetrachloroethene	ug/L	1	U	U
Toluene	ug/L	17	B	
trans-1,2-Dichloroethene	ug/L	1	U	U
trans-1,3-Dichloropropene	ug/L	1	U	U
Trichloroethene	ug/L	0.1	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - VOCs

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
Vinyl Chloride	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - SVOCs

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	320	U	UJ
2,4,5-Trichlorophenol	ug/L	320	U	UJ
2,4,6-Trichlorophenol	ug/L	4100		J
2,4-Dichlorophenol	ug/L	1500		J
2,4-Dimethylphenol	ug/L	320	U	UJ
2,4-Dinitrophenol	ug/L	640	U	UJ
2,4-Dinitrotoluene	ug/L	320	U	UJ
2,6-Dinitrotoluene	ug/L	320	U	UJ
2-Chlorophenol	ug/L	260	J	J
2-Nitrophenol	ug/L	320	U	UJ
3,3'-Dichlorobenzidine	ug/L	320	U	UJ
4,6-Dinitro-2-methylphenol	ug/L	640	U	UJ
4-Nitrophenol	ug/L	640	U	UJ
Anthracene	ug/L	320	U	UJ
Benzidine	ug/L	640	U	UJ
Benzo(a)anthracene	ug/L	320	U	UJ
Benzo(a)pyrene	ug/L	320	U	UJ
Benzo(b)fluoranthene	ug/L	320	U	UJ
Benzo(k)fluoranthene	ug/L	320	U	UJ
bis(2-Chloroethyl)ether	ug/L	320	U	UJ
bis(2-Ethylhexyl)phthalate	ug/L	320	U	UJ
Butylbenzylphthalate	ug/L	320	U	UJ
Chrysene	ug/L	320	U	UJ
Dibenzo(a,h)anthracene	ug/L	320	U	UJ
Diethylphthalate	ug/L	320	U	UJ
Dimethylphthalate	ug/L	320	U	UJ
Di-n-Butylphthalate	ug/L	320	U	UJ
Fluoranthene	ug/L	320	U	UJ
Fluorene	ug/L	320	U	UJ
Hexachlorobenzene	ug/L	320	U	UJ
Hexachlorobutadiene	ug/L	320	U	UJ
Hexachlorocyclopentadiene	ug/L	320	U	UJ
Hexachloroethane	ug/L	320	U	UJ

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - SVOCs

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	320	U	UJ
Isophorone	ug/L	320	U	UJ
Naphthalene	ug/L	320	U	UJ
Nitrobenzene	ug/L	320	U	UJ
N-Nitrosodimethylamine	ug/L	640	U	UJ
N-Nitrosodiphenylamine	ug/L	320	U	UJ
Pentachlorophenol	ug/L	640	U	UJ
Phenanthrene	ug/L	320	U	UJ
Phenol	ug/L	320	J B	UBJ
Pyrene	ug/L	320	U	UJ

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - Inorganics

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
Antimony	ug/L	9		J
Arsenic	ug/L	10.5	E	J
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	3.4		
Copper	ug/L	2.7		
Cyanide	ug/L	3.7	J	J
Lead	ug/L	1		
Mercury	ug/L	0.2	U	U
Nickel	ug/L	12	E	J
Selenium	ug/L	11		
Silver	ug/L	0.62	J	J
Zinc	ug/L	3.7		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1335 - Miscellaneous

ANALYTE	Units	PRR1WATCME-59	LQ	VQ	PRR1WATCME-60	LQ	VQ	PRR1WATCME-61	LQ	VQ
Total Organic Carbon	mg/L	NA			257			NA		
Total Suspended Solids	mg/L	13.5			11.2			6.5		

SAMPLE ANALYSIS DATA SHEETS AND COCs

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1335	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-61	6/4/2012	10:50	water	Grab	1									X									
PRR1WATCME-60	6/2/2012	18:50	water	Grab	19	X	X	X	X	X	X	X	X	X	X								Double Volume TSS, Wet Test Sample
PRR1WATCME-59	6/1/2012	14:00	water	Grab	1									X									
TB06042012	6/4/2012		water	-	3		X																

Page 6 of 1488

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	Wet Testing
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples and WS 15-5 for Effluent Samples

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☑ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 3.2, 1.5°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Laura L. Brandt	6/4/12	1400	TSS JR 6/5/12 0940			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

06/20/2012

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2
Sample wt/vol: 1050 (g/mL) mL Lab File ID: PJDJV03.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 06/05/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/06/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/10/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 66.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	640	U J
108-95-2	Phenol	320 ~~260~~	~~J B~~ UB
111-44-4	Bis(2-chloroethyl)ether	320	U J
95-57-8	2-Chlorophenol	260	J
108-60-1	2,2'-Oxybis(1-chloropropane)	320	U J
67-72-1	Hexachloroethane	320	U
98-95-3	Nitrobenzene	320	U
78-59-1	Isophorone	320	U
88-75-5	2-Nitrophenol	320	U
105-67-9	2,4-Dimethylphenol	320	U
120-83-2	2,4-Dichlorophenol	1500	J
91-20-3	Naphthalene	320	U J
87-68-3	Hexachlorobutadiene	320	U
77-47-4	Hexachlorocyclopentadiene	320	U
88-06-2	2,4,6-Trichlorophenol	4100	J
95-95-4	2,4,5-Trichlorophenol	320	U J
131-11-3	Dimethylphthalate	320	U
606-20-2	2,6-Dinitrotoluene	320	U
51-28-5	2,4-Dinitrophenol	640	U
100-02-7	4-Nitrophenol	640	U
121-14-2	2,4-Dinitrotoluene	320	U
84-66-2	Diethylphthalate	320	U
86-73-7	Fluorene	320	U
534-52-1	4,6-Dinitro-2-methylphenol	640	U
86-30-6	N-Nitrosodiphenylamin [1]	320	U
118-74-1	Hexachlorobenzene	320	U
87-86-5	Pentachlorophenol	640	U
85-01-8	Phenanthrene	320	U
120-12-7	Anthracene	320	U
84-74-2	Di-n-butylphthalate	320	U
206-44-0	Fluoranthene	320	U
92-87-5	Benzidine	640	U
129-00-0	Pyrene	320	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: PJDJV03.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 06/05/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/06/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/10/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 66.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	320	U J
91-94-1	3,3'-Dichlorobenzidine	320	U
56-55-3	Benzo(a)anthracene	320	U
218-01-9	Chrysene	320	U
117-81-7	Bis(2-ethylhexyl)phthalate	320	U
205-99-2	Benzo(b)fluoranthene	320	U
207-08-9	Benzo(k)fluoranthene	320	U
50-32-8	Benzo(a)pyrene	320	U
193-39-5	Indeno(1,2,3-cd)pyrene	320	U
53-70-3	Dibenzo(a,h)anthracene	320	U

[1]Cannot be separated from Diphenylamine

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCHME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPD11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/06/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0 ~~0.18~~	~~J~~ UB
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	0.71	J
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	150 ~~180~~	~~E B~~ D
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	0.093	J
78-93-3	2-Butanone	2000 ~~2400~~	~~E~~ D
67-66-3	Chloroform	66 ~~73~~	~~E~~ DJ
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0 ~~0.037~~	~~J B~~ UB
71-43-2	Benzene	170 ~~200~~	~~E~~ D
107-06-2	1,2-Dichloroethane	11	
79-01-6	Trichloroethene	0.10	J
78-87-5	1,2-Dichloropropane	17	
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	17	~~B~~
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCHME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPD11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/06/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	36	
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCHME-60DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPD13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012
% Moisture: not dec. Date Analyzed: 06/06/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 12.9
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	6.5	U
75-01-4	Vinyl chloride	6.5	U
74-83-9	Bromomethane	6.5	U
75-00-3	Chloroethane	0.62	J D
107-02-8	Acrolein	130	U
75-35-4	1,1-Dichloroethene	6.5	U
75-09-2	Methylene chloride	150	D B
107-13-1	Acrylonitrile	130	U
156-60-5	trans-1,2-Dichloroethene	6.5	U
75-34-3	1,1-Dichloroethane	6.5	U
78-93-3	2-Butanone	2000	D
67-66-3	Chloroform	66	D
71-55-6	1,1,1-Trichloroethane	6.5	U
56-23-5	Carbon tetrachloride	0.25	J D B
71-43-2	Benzene	170	D
107-06-2	1,2-Dichloroethane	6.5	U
79-01-6	Trichloroethene	6.5	U
78-87-5	1,2-Dichloropropane	14	D
75-27-4	Bromodichloromethane	6.5	U
10061-01-5	cis-1,3-Dichloropropene	6.5	U
108-88-3	Toluene	13	D B
10061-02-6	trans-1,3-Dichloropropene	6.5	U
79-00-5	1,1,2-Trichloroethane	6.5	U
127-18-4	Tetrachloroethene	6.5	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCHME-60DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPD13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/06/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 12.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	6.5	U
108-90-7	Chlorobenzene	28	D
100-41-4	Ethylbenzene	6.5	U
75-25-2	Bromoform	6.5	U
79-34-5	1,1,2,2-Tetrachloroethane	6.5	U
541-73-1	1,3-Dichlorobenzene	6.5	U
106-46-7	1,4-Dichlorobenzene	6.5	U
95-50-1	1,2-Dichlorobenzene	6.5	U
120-82-1	1,2,4-Trichlorobenzene	6.5	U
87-61-6	1,2,3-Trichlorobenzene	6.5	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB06042012

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335
Matrix: (SOIL/SED/WATER) Water
Lab Sample ID: 200-11115-4
Sample wt/vol: 25.0 (g/mL) mL
Lab File ID: DIPD08.D
Level: (TRACE/LOW/MED) TRACE
Date Received: 06/05/2012
% Moisture: not dec.
Date Analyzed: 06/06/2012
GC Column: DB-624 ID: 0.20 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.066	J B
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.018	J B
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB06042012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPD08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/06/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.028	J
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 07JUN120938-R051.D

% Moisture: Decanted: (Y/N) Date Received: 06/05/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 06/06/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 06/07/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.087	P J
789-02-6	2,4'-DDT	0.022	P
53-19-0	2,4'-DDD	0.027	P

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 07JUN121445-R031.D

% Moisture: Decanted: (Y/N) Date Received: 06/05/2012

Extraction: (Type) SEPF Date Extracted: 06/06/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 06/07/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.0077	
319-85-7	beta-BHC	0.028	~~B~~
319-86-8	delta-BHC	0.0048	U
58-89-9	gamma-BHC (Lindane)	0.0048	U
76-44-8	Heptachlor	0.0048 ~~0.0040~~	~~J P~~ U
309-00-2	Aldrin	0.0048	U
1024-57-3	Heptachlor epoxide	0.0048 ~~0.0035~~	~~J P~~ U
959-98-8	Endosulfan I	0.010	~~B~~ JN
60-57-1	Dieldrin	0.0095	U
72-55-9	4,4'-DDE	0.018	
72-20-8	Endrin	0.0095 ~~0.0044~~	~~J P~~ U
33213-65-9	Endosulfan II	0.0086	J
72-54-8	4,4'-DDD	0.079	
1031-07-8	Endosulfan sulfate	0.0095	U
50-29-3	4,4'-DDT	0.13	
7421-93-4	Endrin aldehyde	0.0095 ~~0.0060~~	~~J P~~ U
5103-71-9	alpha-Chlordane	0.0048	U
5103-74-2	gamma-Chlordane	0.0048	U
8001-35-2	Toxaphene	0.48	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1335

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11115-2

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 07JUN121106-R141.D

% Moisture: Decanted: (Y/N) Date Received: 06/05/2012

Extraction: (Type) SEPF Date Extracted: 06/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/07/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.95	U
11104-28-2	Aroclor-1221	0.95	U
11141-16-5	Aroclor-1232	0.95	U
53469-21-9	Aroclor-1242	0.95	U
12672-29-6	Aroclor-1248	0.95	U
11097-69-1	Aroclor-1254	0.95	U
11096-82-5	Aroclor-1260	0.95	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 200-11115-2
SDG No.: PRR1335
Client Sample ID: PRR1WATCME-60
Lab Sample ID: 200-11115-2
Matrix: Water
Lab File ID: 13jun122028-r031.d
Analysis Method: 8151A
Date Collected: 06/02/2012 18:50
Extraction Method: 8151A
Date Extracted: 06/09/2012 08:13
Sample wt/vol: 1040(mL)
Date Analyzed: 06/14/2012 04:49
Con. Extract Vol.: 10000(uL)
Dilution Factor: 10000
Injection Volume: 1(uL)
GC Column: RTX-CLP ID: 0.32(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 40348
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	16000	U J	16000	4500
88-85-7	Dinoseb	9100	U J	9100	1800

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-11115-2

SDG No.: PRR1335

Client Sample ID: PRR1WATCME-60 | Lab Sample ID: 200-11115-2

Matrix: Water | Lab File ID: 13jun122028-r031.d

Analysis Method: 8151A | Date Collected: 06/02/2012 18:50

Extraction Method: 8151A | Date Extracted: 06/09/2012 08:13

Sample wt/vol: 1040(mL) | Date Analyzed: 06/14/2012 04:49

Con. Extract Vol.: 10000(uL) | Dilution Factor: 10000

Injection Volume: 1(uL) | GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 40348 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	210000	J	18000	6300
93-76-5	2,4,5-T	6500	↓	4500	1300

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1335
Matrix: WATER Lab Sample Id: 200-11115-2
% Solids: Date Received: 06/05/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	9.0			MS
7440-38-2	Arsenic	10.5			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	3.4			MS
7440-50-8	Copper	2.7			MS
7439-92-1	Lead	1.0			MS
7440-02-0	Nickel	12.0			MS
7782-49-2	Selenium	11.0			MS
7440-22-4	Silver	0.62	J		MS
7440-66-6	Zinc	3.7			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI
Mod. Ref. No.: SDG No.: PRR1335
Matrix: WATER
Lab Sample Id: 200-11115-2
% Solids:
Date Received: 06/05/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-60

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI
Mod. Ref. No.: SDG No.: PRR1335
Matrix: WATER
Lab Sample Id: 200-11115-2
% Solids:
Date Received: 06/05/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	3.7	J		AS

Color Before: WHITE
Clarity Before: CLOUDY
Texture:
Color After:
Clarity After:
Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-60 Lab Sample ID: 200-11115-2

Lab Name: TestAmerica Burlington Job No.: 200-11115-2

SDG ID.: PRR1335

Matrix: Water Date Sampled: 06/02/2012 18:50

Reporting Basis: WET Date Received: 06/05/2012 09:40

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	257	20.0	2.8	mg/L			20	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-61 Lab Sample ID: 200-11115-1

Lab Name: TestAmerica Burlington Job No.: 200-11115-3

SDG ID.: PRR1335

Matrix: Water Date Sampled: 06/04/2012 10:50

Reporting Basis: WET Date Received: 06/05/2012 09:40

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.5	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-60 Lab Sample ID: 200-11115-2

Lab Name: TestAmerica Burlington Job No.: 200-11115-3

SDG ID.: PRR1335

Matrix: Water Date Sampled: 06/02/2012 18:50

Reporting Basis: WET Date Received: 06/05/2012 09:40

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	11.2	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-59
Lab Sample ID: 200-11115-3
Lab Name: TestAmerica Burlington
Job No.: 200-11115-3
SDG ID.: PRR1335
Matrix: Water
Date Sampled: 06/01/2012 14:00
Reporting Basis: WET
Date Received: 06/05/2012 09:40

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.5	0.99		mg/L			1	SM 2540D

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1335 (33816)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #16000R
Project: B0009964.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PR1335 (33816) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	PEST	PCBs	PCDD/ PCDF	MISC
PRR1WATCME-60	33816-001	Water	6/2/2012				X	X	

1. PCDD/PCDF – Dioxins/Furans by USEPA 1613
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blanks exhibited concentrations less than the PQL for 1,2,3,4,6,7,8-HpCDD. The sample concentration was greater than five times the method blank concentration. See Section 2.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

The method blanks exhibited concentrations less than the PQL for 1,2,3,4,6,7,8-HpCDD. The sample concentration was greater than five times the method blank concentration. Therefore, detected sample results were not associated with laboratory contamination and resulted in the removal of the laboratory qualifier (B).

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in the sample and confirmation analysis was performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited concentrations greater than the RL for many congeners. The sample concentrations were greater than five times the method blank concentration. See Section 2.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

The method blanks exhibited concentrations greater than the RL for many of the PCB congeners. The sample concentrations were greater than five times the method blank concentration. Therefore, detected sample results were not associated with laboratory contamination and resulted in the removal of the laboratory qualifier (B).

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

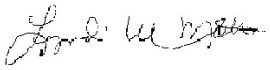
The laboratory added the qualifier “I” which is defined by the laboratory as “Chemical Interference.“ These samples results were qualified as estimated (J).

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: July 1, 2012

PEER REVIEW BY: Dennis Capria

DATE: July 2, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - PCB Congeners

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
PCB-1	pg/L	17.9		
PCB-2	pg/L	16.1		
PCB-3	pg/L	9.24		
PCB-4/10	pg/L	9.73	U	U
PCB-5/8	pg/L	27		
PCB-6	pg/L	17		
PCB-7/9	pg/L	14.9		
PCB-11	pg/L	125	B	
PCB-12/13	pg/L	42.7		
PCB-14	pg/L	19.8		
PCB-15	pg/L	9.73	U	U
PCB-16/32	pg/L	27.7		
PCB-17	pg/L	17.1		
PCB-18	pg/L	48.8		
PCB-19	pg/L	5.04		
PCB-20/21/33	pg/L	42.3		
PCB-22	pg/L	17.9		
PCB-23	pg/L	4.86	U	U
PCB-24/27	pg/L	12.6		
PCB-25	pg/L	4.86	U	U
PCB-26	pg/L	16.4		
PCB-28	pg/L	31.5		
PCB-29	pg/L	4.86	U	U
PCB-30	pg/L	4.86	U	U
PCB-31	pg/L	35		
PCB-34	pg/L	4.86	U	U
PCB-35	pg/L	4.86	U	U
PCB-36	pg/L	4.86	U	U
PCB-37	pg/L	17.9		
PCB-38	pg/L	4.86	U	U
PCB-39	pg/L	4.9		
PCB-40	pg/L	10.6		
PCB-41/64/71/72	pg/L	54.7		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - PCB Congeners

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
PCB-42/59	pg/L	17.9		
PCB-43/49	pg/L	43.3		
PCB-44	pg/L	52.4		
PCB-45	pg/L	7.59		
PCB-46	pg/L	4.86	U	U
PCB-47	pg/L	16.5		
PCB-48/75	pg/L	11.8		
PCB-50	pg/L	4.86	U	U
PCB-51	pg/L	4.86	U	U
PCB-52/69	pg/L	63.2		
PCB-53	pg/L	8.32		
PCB-54	pg/L	4.86	U	U
PCB-55	pg/L	4.86	U	U
PCB-56/60	pg/L	36		
PCB-57	pg/L	4.86	U	U
PCB-58	pg/L	4.86	U	U
PCB-61/70	pg/L	72.3		
PCB-62	pg/L	4.86	U	U
PCB-63	pg/L	4.86	U	U
PCB-65	pg/L	4.86	U	U
PCB-67	pg/L	4.86	U	U
PCB-68	pg/L	4.86	U	U
PCB-73	pg/L	4.86	U	U
PCB-74	pg/L	33.4		
PCB-76/66	pg/L	50.2		
PCB-77	pg/L	7.68		
PCB-78	pg/L	4.86	U	U
PCB-79	pg/L	4.86	U	U
PCB-80	pg/L	4.86	U	U
PCB-81	pg/L	1.05	U	U
PCB-82	pg/L	14.2		
PCB-83	pg/L	4.86	U	U
PCB-84/92	pg/L	40.9	B	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - PCB Congeners

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
PCB-85/116	pg/L	20.4		
PCB-86	pg/L	4.86	U	U
PCB-87/117/125	pg/L	37.9	B	
PCB-88/91	pg/L	15.2		
PCB-89	pg/L	4.86	U	U
PCB-90/101	pg/L	106	B	
PCB-93	pg/L	4.86	U	U
PCB-94	pg/L	4.86	U	U
PCB-95/98/102	pg/L	71.9	B	
PCB-96	pg/L	4.86	U	U
PCB-97	pg/L	32.5		
PCB-99	pg/L	50.5	B	
PCB-100	pg/L	4.86	U	U
PCB-103	pg/L	4.86	U	U
PCB-104	pg/L	4.86	U	U
PCB-105	pg/L	27.8	B	
PCB-106/118	pg/L	109	B	
PCB-107/109	pg/L	8.63		
PCB-108/112	pg/L	4.99		
PCB-110	pg/L	112	B	
PCB-111/115	pg/L	4.86	U	U
PCB-113	pg/L	4.86	U	U
PCB-114	pg/L	4.68	J	J
PCB-119	pg/L	4.86	U	U
PCB-120	pg/L	4.86	U	U
PCB-121	pg/L	4.86	U	U
PCB-122	pg/L	4.86	U	U
PCB-123	pg/L	3.27	J	J
PCB-124	pg/L	5.76		
PCB-126	pg/L	1.48	U	U
PCB-127	pg/L	4.86	U	U
PCB-128/162	pg/L	20.4		
PCB-129	pg/L	7.99		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - PCB Congeners

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
PCB-130	pg/L	8.54		
PCB-131	pg/L	4.86	U	U
PCB-132/161	pg/L	31.7		
PCB-133/142	pg/L	4.86	U	U
PCB-134/143	pg/L	6.87		
PCB-135	pg/L	12.8		
PCB-136	pg/L	19.7		
PCB-137	pg/L	9.16		
PCB-138/163/164	pg/L	135		
PCB-139/149	pg/L	83.5	B	
PCB-140	pg/L	4.86	U	U
PCB-141	pg/L	30.2		
PCB-144	pg/L	4.96		
PCB-145	pg/L	4.86	U	U
PCB-146/165	pg/L	20.8		
PCB-147	pg/L	4.86	U	U
PCB-148	pg/L	4.86	U	U
PCB-150	pg/L	4.86	U	U
PCB-151	pg/L	21.7		
PCB-152	pg/L	4.86	U	U
PCB-153	pg/L	135	B	
PCB-154	pg/L	4.86	U	U
PCB-155	pg/L	4.86	U	U
PCB-156	pg/L	29.8		
PCB-157	pg/L	5.09	U	U
PCB-158/160	pg/L	18.3		
PCB-159	pg/L	4.86	U	U
PCB-166	pg/L	4.86	U	U
PCB-167	pg/L	9.19		
PCB-168	pg/L	4.86	U	U
PCB-169	pg/L	0.902	U	U
PCB-170	pg/L	64.6		
PCB-171	pg/L	16		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - PCB Congeners

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
PCB-172	pg/L	13.4		
PCB-173	pg/L	4.86	U	U
PCB-174	pg/L	80.3		
PCB-175	pg/L	4.86	U	U
PCB-176	pg/L	10.2		
PCB-177	pg/L	38.5		
PCB-178	pg/L	18.4		
PCB-179	pg/L	37.1		
PCB-180	pg/L	228		
PCB-181	pg/L	4.86	U	U
PCB-182/187	pg/L	133		
PCB-183	pg/L	47.8		
PCB-184	pg/L	4.86	U	U
PCB-185	pg/L	12.9		
PCB-186	pg/L	4.86	U	U
PCB-188	pg/L	4.86	U	U
PCB-189	pg/L	9.96		
PCB-190	pg/L	28.5	U,I	UJ
PCB-191	pg/L	4.86	U	U
PCB-192	pg/L	4.86	U	U
PCB-193	pg/L	8.62		
PCB-194	pg/L	120		
PCB-195	pg/L	30.3		
PCB-196/203	pg/L	251		
PCB-197	pg/L	6.47		
PCB-198	pg/L	12.7	U,I	UJ
PCB-199	pg/L	264		
PCB-200	pg/L	19.7		
PCB-201	pg/L	29.1		
PCB-202	pg/L	101		
PCB-204	pg/L	4.86	U	U
PCB-205	pg/L	5.38		
PCB-206	pg/L	456		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - PCB Congeners

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
PCB-207	pg/L	39.5		
PCB-208	pg/L	176		
PCB-209	pg/L	3580		
Total monoCB	pg/L	43.3		
Total diCB	pg/L	255		B
Total triCB	pg/L	277		
Total tetraCB	pg/L	486		
Total pentaCB	pg/L	665		B
Total hexaCB	pg/L	605		B
Total heptaCB	pg/L	718		
Total octaCB	pg/L	827		
Total nonaCB	pg/L	672		
Total decaCB	pg/L	3580		
Total PCB	pg/L	8130		B

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1335 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-60	LQ	VQ
2,3,7,8-TCDD	pg/L	174		
1,2,3,7,8-PeCDD	pg/L	4.43	J	J
1,2,3,4,7,8-HxCDD	pg/L	1.62	J	J
1,2,3,6,7,8-HxCDD	pg/L	7.36	J	J
1,2,3,7,8,9-HxCDD	pg/L	3.64	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	15.2	J,B	J
OCDD	pg/L	808		
Total TCDD	pg/L	736		
Total PeCDD	pg/L	87.9		
Total HxCDD	pg/L	34.6		
Total HpCDD	pg/L	31.9	B	
2,3,7,8-TCDF	pg/L	4.07		
1,2,3,7,8-PeCDF	pg/L	3.99	J	J
2,3,4,7,8-PeCDF	pg/L	19.5	J	J
1,2,3,4,7,8-HxCDF	pg/L	160		
1,2,3,6,7,8-HxCDF	pg/L	27.8		
1,2,3,7,8,9-HxCDF	pg/L	5.65	J	J
2,3,4,6,7,8-HxCDF	pg/L	13.3	J	J
1,2,3,4,6,7,8-HpCDF	pg/L	416		
1,2,3,4,7,8,9-HpCDF	pg/L	26.9		
OCDF	pg/L	2810		
Total TCDF	pg/L	4330		
Total PeCDF	pg/L	3950		
Total HxCDF	pg/L	605		
Total HpCDF	pg/L	529		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	212		

SAMPLE ANALYSIS DATA SHEETS AND COCs

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33816 3.6°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1335	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-60	6/2/2012	18:50	water	Grab	4	X	X																

Requested Analyses

1 Dioxins (17 Isomers) and Total PCDD/PCDFs
2 Congener PCBs (Total)
3
4
7
5
6
7
8
9
10
11
12
13
14
15

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples and WS 15-5 for Effluent Samples

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig A. Burrough	6/4/12	1130	Kathryn L. Benedict	6/5/12 0805		
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

Sample ID:	PRR1WATCME-60				EPA Method 1613
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33816-001
Project:	PRR1335	Sample Size:	1.04 L	QC Batch No.:	4481
Date Collected:	2-Jun-12			Date Analyzed DB-5:	8-Jun-12
Time Collected:	1850				
				Date Received:	5-Jun-12
				Date Extracted:	5-Jun-12
				Dates Analyzed DB-225:	11-Jun-12

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	174			
1,2,3,7,8-PeCDD	4.43			J
1,2,3,4,7,8-HxCDD	1.62			J
1,2,3,6,7,8-HxCDD	7.36			J
1,2,3,7,8,9-HxCDD	ND	3.64		
1,2,3,4,6,7,8-HpCDD	15.2			J,~~B~~
OCDD	808			
2,3,7,8-TCDF	4.07			
1,2,3,7,8-PeCDF	3.99			J
2,3,4,7,8-PeCDF	19.5			J
1,2,3,4,7,8-HxCDF	160			
1,2,3,6,7,8-HxCDF	27.8			
2,3,4,6,7,8-HxCDF	13.3			J
1,2,3,7,8,9-HxCDF	5.65			J
1,2,3,4,6,7,8-HpCDF	416			
1,2,3,4,7,8,9-HpCDF	26.9			
OCDF	2810			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	100	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	78.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	77.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.2	23 - 140	
	13C-OCDD	72.8	17 - 157	
	13C-2,3,7,8-TCDF	88.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	94.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	96.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	78.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	79.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	79.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.4	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	79.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	78.4	26 - 138	
	13C-OCDF	77.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	95.1	35 - 197	

Totals	
Total TCDD	736
Total PeCDD	87.9
Total HxCDD	34.6
Total HpCDD	31.9
Total TCDF	4330
Total PeCDF	3950
Total HxCDF	605
Total HpCDF	529

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 212

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: ANP

Approved By: Calvin Tanaka 11-Jun-2012 13:32

Sample ID:	PRR1WATCME-60		EPA Method 1668A
Client Data	**Sample Data**	**Laboratory Data**	
Name: ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33816-001	Date Received: 5-Jun-12
Project: PRR1335	Sample Size: 1.03 L	QC Batch No.: 4480	Date Extracted: 5-Jun-12
Date Collected: 2-Jun-12	%Solids: 0.680	Date Analyzed DB-1 6-Jun-12	
Time Collected: 1850			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	17.9	4.86		PCB-41/64/71/72	54.7	4.86	
PCB-2	16.1	4.86		PCB-42/59	17.9	4.86	
PCB-3	9.24	4.86		PCB-43/49	43.3	4.86	
PCB-4/10	ND	9.73		PCB-44	52.4	4.86	
PCB-5/8	27.0	9.73		PCB-45	7.59	4.86	
PCB-6	17.0	9.73		PCB-46	ND	4.86	
PCB-7/9	14.9	9.73		PCB-47	16.5	4.86	
PCB-11	125	9.73	B	PCB-48/75	11.8	4.86	
PCB-12/13	42.7	9.73		PCB-50	ND	4.86	
PCB-14	19.8	9.73		PCB-51	ND	4.86	
PCB-15	ND	9.73		PCB-52/69	63.2	4.86	
PCB-16/32	27.7	4.86		PCB-53	8.32	4.86	
PCB-17	17.1	4.86		PCB-54	ND	4.86	
PCB-18	48.8	4.86		PCB-55	ND	4.86	
PCB-19	5.04	4.86		PCB-56/60	36.0	4.86	
PCB-20/21/33	42.3	4.86		PCB-57	ND	4.86	
PCB-22	17.9	4.86		PCB-58	ND	4.86	
PCB-23	ND	4.86		PCB-61/70	72.3	4.86	
PCB-24/27	12.6	4.86		PCB-62	ND	4.86	
PCB-25	ND	4.86		PCB-63	ND	4.86	
PCB-26	16.4	4.86		PCB-65	ND	4.86	
PCB-28	31.5	4.86		PCB-67	ND	4.86	
PCB-29	ND	4.86		PCB-68	ND	4.86	
PCB-30	ND	4.86		PCB-73	ND	4.86	
PCB-31	35.0	4.86		PCB-74	33.4	4.86	
PCB-34	ND	4.86		PCB-76/66	50.2	4.86	
PCB-35	ND	4.86		PCB-77	7.68	4.86	
PCB-36	ND	4.86		PCB-78	ND	4.86	
PCB-37	17.9	4.86		PCB-79	ND	4.86	
PCB-38	ND	4.86		PCB-80	ND	4.86	
PCB-39	4.90	4.86		PCB-81	ND	1.05	
PCB-40	10.6	4.86		PCB-82	14.2	4.86	

Sample ID:	PRR1WATCME-60			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33816-001	Date Received: 5-Jun-12
Project:	PRR1335	Sample Size: 1.03 L	QC Batch No.: 4480	Date Extracted: 5-Jun-12
Date Collected:	2-Jun-12	%Solids: 0.680	Date Analyzed DB-1 6-Jun-12	
Time Collected:	1850			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.86		PCB-127	ND	4.86	
PCB-84/92	40.9	4.86	B	PCB-128/162	20.4	4.86	
PCB-85/116	20.4	4.86		PCB-129	7.99	4.86	
PCB-86	ND	4.86		PCB-130	8.54	4.86	
PCB-87/117/125	37.9	4.86	B	PCB-131	ND	4.86	
PCB-88/91	15.2	4.86		PCB-132/161	31.7	4.86	
PCB-89	ND	4.86		PCB-133/142	ND	4.86	
PCB-90/101	106	4.86	B	PCB-134/143	6.87	4.86	
PCB-93	ND	4.86		PCB-135	12.8	4.86	
PCB-94	ND	4.86		PCB-136	19.7	4.86	
PCB-95/98/102	71.9	4.86	B	PCB-137	9.16	4.86	
PCB-96	ND	4.86		PCB-138/163/164	135	4.86	
PCB-97	32.5	4.86		PCB-139/149	83.5	4.86	B
PCB-99	50.5	4.86	B	PCB-140	ND	4.86	
PCB-100	ND	4.86		PCB-141	30.2	4.86	
PCB-103	ND	4.86		PCB-144	4.96	4.86	
PCB-104	ND	4.86		PCB-145	ND	4.86	
PCB-105	27.8	4.86	B	PCB-146/165	20.8	4.86	
PCB-106/118	109	4.86	B	PCB-147	ND	4.86	
PCB-107/109	8.63	4.86		PCB-148	ND	4.86	
PCB-108/112	4.99	4.86		PCB-150	ND	4.86	
PCB-110	112	4.86	B	PCB-151	21.7	4.86	
PCB-111/115	ND	4.86		PCB-152	ND	4.86	
PCB-113	ND	4.86		PCB-153	135	4.86	B
PCB-114	4.68	4.86	J	PCB-154	ND	4.86	
PCB-119	ND	4.86		PCB-155	ND	4.86	
PCB-120	ND	4.86		PCB-156	29.8	4.86	
PCB-121	ND	4.86		PCB-157	ND	5.09	
PCB-122	ND	4.86		PCB-158/160	18.3	4.86	
PCB-123	3.27	4.86	J	PCB-159	ND	4.86	
PCB-124	5.76	4.86		PCB-166	ND	4.86	
PCB-126	ND	1.48		PCB-167	9.19	4.86	

Sample ID:	PRR1WATCME-60		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33816-001
Project:	PRR1335	Sample Size: 1.03 L	QC Batch No.: 4480
Date Collected:	2-Jun-12	%Solids: 0.680	Date Analyzed DB-1 6-Jun-12
Time Collected:	1850		Date Received: 5-Jun-12
			Date Extracted: 5-Jun-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	4.86	
PCB-169	ND	0.902	
PCB-170	64.6	4.86	
PCB-171	16.0	4.86	
PCB-172	13.4	4.86	
PCB-173	ND	4.86	
PCB-174	80.3	4.86	
PCB-175	ND	4.86	
PCB-176	10.2	4.86	
PCB-177	38.5	4.86	
PCB-178	18.4	4.86	
PCB-179	37.1	4.86	
PCB-180	228	4.86	
PCB-181	ND	4.86	
PCB-182/187	133	4.86	
PCB-183	47.8	4.86	
PCB-184	ND	4.86	
PCB-185	12.9	4.86	
PCB-186	ND	4.86	
PCB-188	ND	4.86	
PCB-189	9.96	4.86	
PCB-190	ND	28.5	~~I~~ J
PCB-191	ND	4.86	
PCB-192	ND	4.86	
PCB-193	8.62	4.86	
PCB-194	120	4.86	
PCB-195	30.3	4.86	
PCB-196/203	251	4.86	
PCB-197	6.47	4.86	
PCB-198	ND	12.7	~~I~~ J
PCB-199	264	4.86	
PCB-200	19.7	4.86	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	29.1	4.86	
PCB-202	101	4.86	
PCB-204	ND	4.86	
PCB-205	5.38	4.86	
PCB-206	456	4.86	
PCB-207	39.5	4.86	
PCB-208	176	4.86	
PCB-209	3580	4.86	
Total monoCB	43.3	4.86	
Total diCB	255	9.73	~~B~~
Total triCB	277	4.86	
Total tetraCB	486	4.86	
Total pentaCB	665	4.86	~~B~~
Total hexaCB	605	4.86	~~B~~
Total heptaCB	718	4.86	
Total octaCB	827	4.86	
Total nonaCB	672	4.86	
Total decaCB	3580	4.86	
Total PCB	8130	9.73	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: **0.00658**

Sample ID:	PRR1WATCME-60			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33816-001	Date Received: 5-Jun-12
Project:	PRR1335	Sample Size: 1.03 L	QC Batch No.: 4480	Date Extracted: 5-Jun-12
Date Collected:	2-Jun-12		Date Analyzed 6-Jun-12	
Time Collected:	1850			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-1	75.2	25	150	
	13C-PCB-3	77.7	25	150	
	13C-PCB-4	72.5	25	150	
	13C-PCB-11	87.3	25	150	
	13C-PCB-9	83.9	25	150	
	13C-PCB-19	62.8	25	150	
	13C-PCB-28	77.3	25	150	
	13C-PCB-32	62.6	25	150	
	13C-PCB-37	121	25	150	
	13C-PCB-47	76.9	25	150	
	13C-PCB-52	76.9	25	150	
	13C-PCB-54	52.7	25	150	
	13C-PCB-70	92.8	25	150	
	13C-PCB-77	98.3	25	150	
	13C-PCB-80	91.9	25	150	
	13C-PCB-81	96.0	25	150	
	13C-PCB-95	86.3	25	150	
	13C-PCB-97	89.1	25	150	
	13C-PCB-101	89.1	25	150	
	13C-PCB-104	84.3	25	150	
	13C-PCB-105	73.5	25	150	
	13C-PCB-114	73.2	25	150	
	13C-PCB-118	94.1	25	150	
	13C-PCB-123	94.8	25	150	
	13C-PCB-126	93.6	25	150	
	13C-PCB-127	81.9	25	150	
	13C-PCB-138	94.0	25	150	
	13C-PCB-141	89.8	25	150	
	13C-PCB-153	86.6	25	150	
	13C-PCB-155	59.9	25	150	

Chemist: DMS

Approved by: Calvin Tanaka 11-Jun-2012 11:52

Sample ID:	PRR1WATCME-60			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33816-001	Date Received: 5-Jun-12
Project:	PRR1335	Sample Size: 1.03 L	QC Batch No.: 4480	Date Extracted: 5-Jun-12
Date Collected:	2-Jun-12		Date Analyzed 6-Jun-12	
Time Collected:	1850			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-156	101	25	150	
	13C-PCB-157	98.7	25	150	
	13C-PCB-159	99.0	25	150	
	13C-PCB-167	98.2	25	150	
	13C-PCB-169	105	25	150	
	13C-PCB-170	88.3	25	150	
	13C-PCB-180	88.3	25	150	
	13C-PCB-188	84.1	25	150	
	13C-PCB-189	93.9	25	150	
	13C-PCB-194	92.4	25	150	
	13C-PCB-202	68.5	25	150	
	13C-PCB-206	113	25	150	
	13C-PCB-208	109	25	150	
	13C-PCB-209	125	25	150	
CRS	13C-PCB-79	98.7	30	135	
	13C-PCB-178	91.2	30	135	

Chemist: DMS

Approved by: Calvin Tanaka 11-Jun-2012 11:52

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1344 (200-11150)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #16601R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PRR1344 (200-11150) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATCME-63	200-11150-1	Water	6/6/2012		X	X	X	X	X
PRR1WATCMI-63	200-11150-2	Water	6/6/2012		X	X	X		
PRR1WATCME-62	200-11150-3	Water	6/5/2012						X
TB06062012	200-11150-4	Water	6/6/2012		X				

Miscellaneous parameters include Total Suspended Solids (TSS)
PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
Volatiles, and Semivolatiles by USEPA SOM0.1.2.
Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

Surrogate 4-Chloroaniline was not detected in sample location PRR1WATCME-63. The associated non-detect compounds were rejected.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during semivolatile analysis.

The method blank exhibited concentration greater than the PQL for phenol. This compound was detected in the sample at concentrations less than the PQL; therefore, phenol in the sample is most likely from laboratory contamination. The sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCME-63	Phenol-d5	AC
	Bis(2-chloroethyl)ether-d8	AC
	2-Chlorophenol-d4	AC
	4-Methylphenol-d8	AC
	Nitrobenzene-d5	AC
	2-Nitrophenol-d4	AC
	2,4-Dichlorophenol-d3	> UL
	4-Chloroaniline-d4	0%
	Dimethylphthalate-d6	AC
	Acenapthylene-d8	AC
	4-Nitrophenol-d4	AC
	Fluorene-d10	AC
	4,6-Dinitro-2-methylphenol-d2	AC
	Anthracene-d10	AC
	Pyrene-d10	AC
	Benzo(a)pyrene-d12	AC
PRR1WATCMI-63	Phenol-d5	D
	Bis(2-chloroethyl)ether-d8	D
	2-Chlorophenol-d4	D
	4-Methylphenol-d8	D
	Nitrobenzene-d5	D
	2-Nitrophenol-d4	D
	2,4-Dichlorophenol-d3	D
	4-Chloroaniline-d4	D
	Dimethylphthalate-d6	D
	Acenapthylene-d8	D
	4-Nitrophenol-d4	D
	Fluorene-d10	D
	4,6-Dinitro-2-methylphenol-d2	D
	Anthracene-d10	D
	Pyrene-d10	D
	Benzo(a)pyrene-d12	D

Diluted (D)

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	UJ[1]
	Detect	J[1]

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

The compounds 2,4-dichlorophenol and 2,4,6-trichlorophenol are qualified as estimated due to the 2,4-dichlooorophenol-d3 surrogate exhibiting a recovery above control limits. The compounds hexachlorocyclopentadiene and 3,3-dichlorobenzidine were rejected due to surrogate recovery of 4-chloroaniline-d4 being equal to (0%).

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction and re-analysis.

Sample locations PRR1WATCME-63 and PRR1WATCMI-63 were analyzed at a dilution to achieve target compounds within the calibration range. The reporting limits are elevated due to the diluted analysis.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of methylene chloride and carbon tetrachloride. The trip blank exhibited low level concentrations of carbon tetrachloride, benzene, and trans-1,3-dichloropropene. These compounds were detected in the samples. See Section 2.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

The method blanks exhibited concentrations less than the PQL for methylene chloride and carbon tetrachloride. The trip blank also exhibited concentrations less than the PQL for carbon tetrachloride, benzene, and trans-1,3-dichloropropene.

The compound carbon tetrachloride was detected in sample location PRR1WATCME-63 at concentration less than the PQL; therefore, carbon tetrachloride i that were detected in the sample are presumed to be laboratory contamination. The carbon tetrachloride result for sample location PRR1WATCME-63 is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

Methylene chloride was detected in for sample location PRR1WATCME-63 at concentration greater than the PQL. Therefore, detected sample results were not associated with laboratory contamination and resulted in the removal of the laboratory qualifier (B).

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction or re-analysis.

Sample locations PRR1WATCME-63 and PRR1WATCME-63 were analyzed at a dilution to achieve target compounds within the calibration range. The reporting limits are elevated due to the diluted analysis.

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
PRR1WATCME-63	Methylene chloride	130 E	130 D	130 D
	2-Butanone	2500 E	2200 D	2200 D
	Benzene	320 E	290 D	290 D

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

Reported Sample Results	Qualification
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC and gamma-Chlordane. These compounds were detected in sample location PRR1WATCME-63 at concentrations less than the PQL. See Section 2.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis

The method blank exhibited concentrations less than the PQL for beta-BHC and gamma-Chlordane. These compounds were detected in sample location PRR1WATCME-63 at a concentration less than the PQL. Therefore, these compounds in the sample presumed to be attributed from laboratory contamination. The beta-BHC and gamma-Chlordane results for sample location PRR1WATCME-63 are reported at the PQL and flagged UB indicating non-detect due to laboratory contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCMI-63	Tetrachloro-m-xylene	AC
	Decachlorobiphenyl	< LL but > 10%

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 fraction 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	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

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

Sample Locations	Compound	LCS Recovery
PRR1WATCME-63	gamma-Chlordane	> 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
> 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

The gamma-Chlordane sample result was reported as non-detect due to method blank contamination. Therefore, the sample result is not affected from the high LCS recovery for gamma-Chlordane.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction or re-analysis. 4,4-DDT and 2,4'-DDD required diluted analysis to report sample concentrations with the calibration range. Therefore, reporting limits are elevated.

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
PRR1WATCME-63	4,4'-DDT	0.18 E	0.16 D	0.16 D
PRR1WATCMI-63	2,4'-DDD	5.9 E	5.0 D	5.0 D
	delta-BHC	6.0 E	4.6 D	4.6 D

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

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
PRR1WATCME-63	2,4'-DDE	489%
	alpha-BHC	620%
	beta-BHC	43.9%
	delta-BHC	152%
	gamma-BHC	151%
	Heptachlor	376%
	Aldrin	152%
	Heptachlor epoxide	>1000%
PRR1WATCME-63	Endosulfan I	210%
	Endrin	187%
	Endosulfan sulfate	>1000%
	alpha-Chlordane	662%
	gamma-Chlordane	>1000%
PRR1WATCMI-63	2,4'-DDE	563%
	2,4'-DDT	103%
PRR1WATCMI-63 DL	2,4'-DDD	101%
	delta-BHC	173%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCME-63	2,4-Dichlorophenylacetic Acid	D
PRR1WATCMI-63		D

Diluted (D)

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 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	UJ[1]
	Detect	J[1]

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicides were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction or re-analysis.

Sample locations PRR1WATCME-63 and PRR1WATCME-63 were analyzed at a dilution to achieve target compounds within the calibration range. The reporting limits are elevated due to the diluted analysis**.**

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Bias – Method blank exhibited a concentration less than the PQL for lead, selenium, and zinc. The sample concentration was less than five times the method blank result for lead and zinc. Therefore, lead and zinc in the sample are most likely from laboratory contamination. The sample concentration for selenium was greater than five times the method blank result. Therefore, selenium detected sample results were not associated with blank contamination.

Accuracy - The LCS recoveries for selenium and zinc were above the control limits of 80-120%. Project accuracy measurement performance criteria were not met for the affected analytes.

Matrix Interference – The serial dilution percent difference (%D) was greater than the acceptance limit for nickel. Project accuracy measurement performance criteria were not met for the affected analytes.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

Lead and zinc were detected in sample location PRR1WATCME-63 at concentrations less than five times the method blank concentration; therefore, these analytes are most likely from laboratory contamination. The lead result for sample location PRR1WATCME-63 is reported at the PQL and flagged UB indicating non-detect due to blank contamination. The zinc result is flagged UB at the detected sample

concentration.

Selenium was detected in sample location PRR1WATCME-63 at concentrations greater than five times the method blank concentration. Therefore, detected sample results were not associated with blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

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

Sample Locations	Compound	LCS Recovery
PRR1WATCME-63	Selenium	123%
	Zinc	128%

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

4. MATRIX SPIKE (MS)

An MS analysis is generated to determine the accuracy of the analytical procedure in a given matrix.

An MS analysis was performed on sample PRR1WATCME-63 for ICP-MS metals analysis. Upon evaluation precision and accuracy indicators were favorable.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATCME-63 was selected for the duplicate analysis. The difference between the sample and duplicate values obtained for all analytes met project measurement performance criteria.

6. SERIAL DILUTION

Sample PRR1WATCME-63 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria with the following exceptions.

The observed %D for nickel did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1WATCME-63	Nickel	13%

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
> 10%	Non-detect	UJ
	Detect	J

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

3. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

A MS was not performed on a sample location associated with this SDG.

4. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location associated with this SDG.

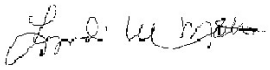
5. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: July 1, 2012

PEER REVIEW: Dennis Capria

DATE: July 2, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - PCBs

ANALYTE	Units	PRR1WATCME-63	LQ	VQ
Aroclor-1016	ug/L	0.95	U	U
Aroclor-1221	ug/L	0.95	U	U
Aroclor-1232	ug/L	0.95	U	U
Aroclor-1242	ug/L	0.95	U	U
Aroclor-1248	ug/L	0.95	U	U
Aroclor-1254	ug/L	0.95	U	U
Aroclor-1260	ug/L	0.95	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - Pesticides

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
2,4'-DDD	ug/L	0.075			5	P D	DJN
2,4'-DDE	ug/L	0.0095	J P	U	2	P	JN
2,4'-DDT	ug/L	0.034			1.6	P	JN
4,4'-DDD	ug/L	0.15			NA		
4,4'-DDE	ug/L	0.03			NA		
4,4'-DDT	ug/L	0.16	D	D	NA		
Aldrin	ug/L	0.0048	J P	U	NA		
Alpha-BHC	ug/L	0.0048	J P	U	NA		
Alpha-Chlordane	ug/L	0.0048	J P	U	NA		
Beta-BHC	ug/L	0.0048	P B	UB	NA		
Delta-BHC	ug/L	0.0048	J P	U	4.6	P D	DJN
Dieldrin	ug/L	0.0095	U	U	NA		
Endosulfan I	ug/L	0.0052	P	JN	NA		
Endosulfan II	ug/L	0.0022	J	J	NA		
Endosulfan Sulfate	ug/L	0.0095	J P	U	NA		
Endrin	ug/L	0.0095	J P	U	NA		
Endrin Aldehyde	ug/L	0.0095	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0048	J P	U	NA		
Gamma-Chlordane	ug/L	0.0048	J P B	UB	NA		
Heptachlor	ug/L	0.0048	J P	U	NA		
Heptachlor Epoxide	ug/L	0.0072	P	JN	NA		
Toxaphene	ug/L	0.48	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - Herbicides

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
2,4,5-T	ug/L	1600	J	J	8000		J
2,4-D	ug/L	85000		J	NA		
2,4-DB	ug/L	8100	U	UJ	NA		
Dinoseb	ug/L	4500	U	UJ	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - VOCs

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
1,1,1-Trichloroethane	ug/L	2.6	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	2.6	U	U	NA		
1,1,2-Trichloroethane	ug/L	2.6	U	U	NA		
1,1-Dichloroethane	ug/L	2.6	U	U	NA		
1,1-Dichloroethene	ug/L	2.6	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	2.6	U	U	5	J	J
1,2,4-Trichlorobenzene	ug/L	2.6	U	U	NA		
1,2-Dichlorobenzene	ug/L	2.6	U	U	NA		
1,2-Dichloroethane	ug/L	15			NA		
1,2-Dichloropropane	ug/L	18			NA		
1,3-Dichlorobenzene	ug/L	2.6	U	U	NA		
1,4-Dichlorobenzene	ug/L	2.6	U	U	NA		
2-Butanone	ug/L	2200	D	D	2000		
Acrolein	ug/L	51	U	U	NA		
Acrylonitrile	ug/L	51	U	U	NA		
Benzene	ug/L	290	D	D	NA		
Bromodichloromethane	ug/L	2.6	U	U	NA		
Bromoform	ug/L	2.6	U	U	NA		
Bromomethane	ug/L	2.6	U	U	NA		
Carbon Tetrachloride	ug/L	2.6	J B	UB	NA		
Chlorobenzene	ug/L	100			NA		
Chloroethane	ug/L	0.48	J	J	NA		
Chloroform	ug/L	57			NA		
Chloromethane	ug/L	0.14	J	J	NA		
cis-1,3-Dichloropropene	ug/L	2.6	U	U	NA		
Dibromochloromethane	ug/L	2.6	U	U	NA		
Ethylbenzene	ug/L	2.6	U	U	NA		
Methylene Chloride	ug/L	130	D B	D	NA		
Tetrachloroethene	ug/L	2.6	U	U	NA		
Toluene	ug/L	27			NA		
trans-1,2-Dichloroethene	ug/L	2.6	U	U	NA		
trans-1,3-Dichloropropene	ug/L	2.6	U	U	NA		
Trichloroethene	ug/L	0.13	J	J	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - VOCs

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
Vinyl Chloride	ug/L	2.6	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - SVOCs

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	95	U	U	NA		
2,4,5-Trichlorophenol	ug/L	95	U	U	5100		J
2,4,6-Trichlorophenol	ug/L	1400		J	NA		
2,4-Dichlorophenol	ug/L	950		J	NA		
2,4-Dimethylphenol	ug/L	95	U	U	NA		
2,4-Dinitrophenol	ug/L	190	U	U	NA		
2,4-Dinitrotoluene	ug/L	95	U	U	NA		
2,6-Dinitrotoluene	ug/L	95	U	U	NA		
2-Chlorophenol	ug/L	220			NA		
2-Nitrophenol	ug/L	95	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	R	U		NA		
4,6-Dinitro-2-methylphenol	ug/L	190	U	U	9500	U	UJ
4-Nitrophenol	ug/L	190	U	U	NA		
Anthracene	ug/L	95	U	U	NA		
Benzidine	ug/L	190	U	U	NA		
Benzo(a)anthracene	ug/L	95	U	U	NA		
Benzo(a)pyrene	ug/L	95	U	U	NA		
Benzo(b)fluoranthene	ug/L	95	U	U	NA		
Benzo(k)fluoranthene	ug/L	95	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	95	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	95	U	U	NA		
Butylbenzylphthalate	ug/L	95	U	U	NA		
Chrysene	ug/L	95	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	95	U	U	NA		
Diethylphthalate	ug/L	95	U	U	NA		
Dimethylphthalate	ug/L	95	U	U	NA		
Di-n-Butylphthalate	ug/L	95	U	U	NA		
Fluoranthene	ug/L	95	U	U	NA		
Fluorene	ug/L	95	U	U	NA		
Hexachlorobenzene	ug/L	95	U	U	NA		
Hexachlorobutadiene	ug/L	95	U	U	NA		
Hexachlorocyclopentadiene	ug/L	R	U		NA		
Hexachloroethane	ug/L	95	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - SVOCs

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	95	U	U	NA		
Isophorone	ug/L	95	U	U	NA		
Naphthalene	ug/L	95	U	U	NA		
Nitrobenzene	ug/L	95	U	U	NA		
N-Nitrosodimethylamine	ug/L	190	U	U	NA		
N-Nitrosodiphenylamine	ug/L	95	U	U	NA		
Pentachlorophenol	ug/L	190	U	U	NA		
Phenanthrene	ug/L	95	U	U	NA		
Phenol	ug/L	300			NA		
Pyrene	ug/L	95	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - Inorganics

ANALYTE	Units	PRR1WATCME-63	LQ	VQ
Antimony	ug/L	10.9		
Arsenic	ug/L	9.5		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	1.8	J	J
Copper	ug/L	1.9	J	J
Cyanide	ug/L	3.9	J	J
Lead	ug/L	1	J	UB
Mercury	ug/L	0.18	J	J
Nickel	ug/L	17.2	E	J
Selenium	ug/L	11.6		J
Silver	ug/L	0.41	J	J
Zinc	ug/L	6.1		UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1344 - Miscellaneous

ANALYTE	Units	PRR1WATCME-62	LQ	VQ	PRR1WATCME-63	LQ	VQ
Total Organic Carbon	mg/L	NA			110		
Total Suspended Solids	mg/L	13.8			5.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1344	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-63	6/6/2012	10:28	water	Grab	18	X	X	X	X	X	X	X	X	X	X								
PRR1WATCMI-63	6/6/2012	13:00	water	Grab	9		X	X		X			X										
PRR1WATCME-62	6/5/2012	14:15	water	Grab	1									X									
TB06062012	6/6/2012		water	—	3		X																

Page 14 of 129

	Requested Analyses
1	TOC
2	VOCs
3	SVOCs
4	Arodor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	WET Test
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Cecil L. Bivans Jr	6/6/12	1550	6-7-12 0905			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

06/21/2012

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPF06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 5.1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.14	J
75-01-4	Vinyl chloride	2.6	U
74-83-9	Bromomethane	2.6	U
75-00-3	Chloroethane	0.48	J
107-02-8	Acrolein	51	U
75-35-4	1,1-Dichloroethene	2.6	U
75-09-2	Methylene chloride	130 ~~E B~~ D	
107-13-1	Acrylonitrile	51	U
156-60-5	trans-1,2-Dichloroethene	2.6	U
75-34-3	1,1-Dichloroethane	2.6	U
78-93-3	2-Butanone	2200 ~~2500~~	~~E~~ D
67-66-3	Chloroform	57	
71-55-6	1,1,1-Trichloroethane	2.6	U
56-23-5	Carbon tetrachloride	~~0.094~~	~~J B~~ UD
71-43-2	Benzene	290 ~~320~~	~~E~~ D
107-06-2	1,2-Dichloroethane	15	
79-01-6	Trichloroethene	0.13	J
78-87-5	1,2-Dichloropropane	18	
75-27-4	Bromodichloromethane	2.6	U
10061-01-5	cis-1,3-Dichloropropene	2.6	U
108-88-3	Toluene	27	
10061-02-6	trans-1,3-Dichloropropene	2.6	U
79-00-5	1,1,2-Trichloroethane	2.6	U
127-18-4	Tetrachloroethene	2.6	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPF06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 5.1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	2.6	U
108-90-7	Chlorobenzene	100	
100-41-4	Ethylbenzene	2.6	U
75-25-2	Bromoform	2.6	U
79-34-5	1,1,2,2-Tetrachloroethane	2.6	U
541-73-1	1,3-Dichlorobenzene	2.6	U
106-46-7	1,4-Dichlorobenzene	2.6	U
95-50-1	1,2-Dichlorobenzene	2.6	U
120-82-1	1,2,4-Trichlorobenzene	2.6	U
87-61-6	1,2,3-Trichlorobenzene	2.6	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 36.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	18	U
75-01-4	Vinyl chloride	18	U
74-83-9	Bromomethane	18	U
75-00-3	Chloroethane	18	U
107-02-8	Acrolein	370	U
75-35-4	1,1-Dichloroethene	18	U
75-09-2	Methylene chloride	130	D B
107-13-1	Acrylonitrile	370	U
156-60-5	trans-1,2-Dichloroethene	18	U
75-34-3	1,1-Dichloroethane	18	U
78-93-3	2-Butanone	2200	D
67-66-3	Chloroform	57	D
71-55-6	1,1,1-Trichloroethane	18	U
56-23-5	Carbon tetrachloride	0.74	J D B
71-43-2	Benzene	290	D
107-06-2	1,2-Dichloroethane	18	U
79-01-6	Trichloroethene	18	U
78-87-5	1,2-Dichloropropane	17	J D
75-27-4	Bromodichloromethane	18	U
10061-01-5	cis-1,3-Dichloropropene	18	U
108-88-3	Toluene	26	D
10061-02-6	trans-1,3-Dichloropropene	18	U
79-00-5	1,1,2-Trichloroethane	18	U
127-18-4	Tetrachloroethene	18	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 36.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	18	U
108-90-7	Chlorobenzene	93	D
100-41-4	Ethylbenzene	18	U
75-25-2	Bromoform	18	U
79-34-5	1,1,2,2-Tetrachloroethane	18	U
541-73-1	1,3-Dichlorobenzene	18	U
106-46-7	1,4-Dichlorobenzene	18	U
95-50-1	1,2-Dichlorobenzene	18	U
120-82-1	1,2,4-Trichlorobenzene	18	U
87-61-6	1,2,3-Trichlorobenzene	18	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPG09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/13/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 88.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	2000	
87-61-6	1,2,3-Trichlorobenzene	5.0	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB06062012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPF11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.019	J B
71-43-2	Benzene	0.049	J
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.19	J
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB06062012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPF11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: PJDJS04.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/09/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	190	U
108-95-2	Phenol	300	
111-44-4	Bis(2-chloroethyl)ether	95	U
95-57-8	2-Chlorophenol	220	
108-60-1	2,2'-Oxybis(1-chloropropane)	95	U
67-72-1	Hexachloroethane	95	U
98-95-3	Nitrobenzene	95	U
78-59-1	Isophorone	95	U
88-75-5	2-Nitrophenol	95	U
105-67-9	2,4-Dimethylphenol	95	U
120-83-2	2,4-Dichlorophenol	950	J
91-20-3	Naphthalene	95	U
87-68-3	Hexachlorobutadiene	95	U
77-47-4	Hexachlorocyclopentadiene	~~95~~	~~U~~ R
88-06-2	2,4,6-Trichlorophenol	1400	J
95-95-4	2,4,5-Trichlorophenol	95	U
131-11-3	Dimethylphthalate	95	U
606-20-2	2,6-Dinitrotoluene	95	U
51-28-5	2,4-Dinitrophenol	190	U
100-02-7	4-Nitrophenol	190	U
121-14-2	2,4-Dinitrotoluene	95	U
84-66-2	Diethylphthalate	95	U
86-73-7	Fluorene	95	U
534-52-1	4,6-Dinitro-2-methylphenol	190	U
86-30-6	N-Nitrosodiphenylamin [1]	95	U
118-74-1	Hexachlorobenzene	95	U
87-86-5	Pentachlorophenol	190	U
85-01-8	Phenanthrene	95	U
120-12-7	Anthracene	95	U
84-74-2	Di-n-butylphthalate	95	U
206-44-0	Fluoranthene	95	U
92-87-5	Benzidine	190	U
129-00-0	Pyrene	95	U

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: PJDJS04.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/09/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	95	U
91-94-1	3,3'-Dichlorobenzidine	~~95~~	~~U~~ R
56-55-3	Benzo(a)anthracene	95	U
218-01-9	Chrysene	95	U
117-81-7	Bis(2-ethylhexyl)phthalate	95	U
205-99-2	Benzo(b)fluoranthene	95	U
207-08-9	Benzo(k)fluoranthene	95	U
50-32-8	Benzo(a)pyrene	95	U
193-39-5	Indeno(1,2,3-cd)pyrene	95	U
53-70-3	Dibenzo(a,h)anthracene	95	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: PJDJS09.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/09/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1000.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	5100	J
534-52-1	4,6-Dinitro-2-methylphenol	9500	U J

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 13JUN121913-R051.D

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 06/07/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 06/13/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.0095 ~~0.0090~~	~~J P~~ U
789-02-6	2,4'-DDT	0.034	
53-19-0	2,4'-DDD	0.075	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1
Sample wt/vol: 1050 (g/mL) mL Lab File ID: 14JUN121611-R041.D
% Moisture: Decanted: (Y/N) Date Received: 06/07/2012
Extraction: (Type) SEPF Date Extracted: 06/07/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 06/15/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.0048	~~0.00090~~	~~J P~~ U
319-85-7	beta-BHC	0.0048	~~0.0071~~	~~P B~~ UB
319-86-8	delta-BHC	0.0048	~~0.0026~~	~~J P~~ U
58-89-9	gamma-BHC (Lindane)	0.0048	~~0.00075~~	~~J P~~ U
76-44-8	Heptachlor	0.0048	~~0.00069~~	~~J P~~ U
309-00-2	Aldrin	0.0048	~~0.00071~~	~~J P~~ U
1024-57-3	Heptachlor epoxide		0.0072	~~P~~ JN
959-98-8	Endosulfan I		0.0052	~~P~~ JN
60-57-1	Dieldrin		0.0095	U
72-55-9	4,4'-DDE		0.030	
72-20-8	Endrin	0.0095	~~0.0016~~	~~J P~~ U
33213-65-9	Endosulfan II		0.0022	J
72-54-8	4,4'-DDD		0.15	
1031-07-8	Endosulfan sulfate	0.0095	~~0.00078~~	~~J P~~ U
50-29-3	4,4'-DDT	0.16	~~0.18~~	~~P~~ D
7421-93-4	Endrin aldehyde		0.0095	U
5103-71-9	alpha-Chlordane	0.0048	~~0.0012~~	~~J P~~ U
5103-74-2	gamma-Chlordane	0.0048	~~0.0024~~	~~J P B~~ UB
8001-35-2	Toxaphene		0.48	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 14JUN121611-R031.D

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Extraction: (Type) SEPF Date Extracted: 06/07/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 06/15/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.0011	J P D
319-85-7	beta-BHC	0.0072	J D B
319-86-8	delta-BHC	0.0020	J P D
58-89-9	gamma-BHC (Lindane)	0.0017	J D
76-44-8	Heptachlor	0.00068	J P D
309-00-2	Aldrin	0.00052	J P D
1024-57-3	Heptachlor epoxide	0.0065	J P D
959-98-8	Endosulfan I	0.0053	J P D
60-57-1	Dieldrin	0.019	U
72-55-9	4,4'-DDE	0.027	D
72-20-8	Endrin	0.019	U
33213-65-9	Endosulfan II	0.019	U
72-54-8	4,4'-DDD	0.13	D
1031-07-8	Endosulfan sulfate	0.019	U
50-29-3	4,4'-DDT	0.16	D
7421-93-4	Endrin aldehyde	0.019	U
5103-71-9	alpha-Chlordane	0.0012	J P D
5103-74-2	gamma-Chlordane	0.0028	J P D B
8001-35-2	Toxaphene	0.95	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 13JUN121913-R091.D

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Extraction: (Type) SEPF Date Extracted: 06/07/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/14/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	2.0	J JN
53-19-0	2,4'-DDD	5.0 ~~5.9~~ ~~E P~~	DJN
789-02-6	2,4'-DDT	1.6	J JN

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-63DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 13JUN121913-R081.D

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Extraction: (Type) SEPF Date Extracted: 06/07/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/13/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	2.3	P D
53-19-0	2,4'-DDD	5.0	P D JN
789-02-6	2,4'-DDT	1.6	J P D

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 14JUN121611-R081.D

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Extraction: (Type) SEPF Date Extracted: 06/07/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/15/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	4.6 ~~6.0~~	~~E P~~ DJN

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-63DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-2
Sample wt/vol: 1050 (g/mL) mL Lab File ID: 14JUN121611-R071.D
% Moisture: Decanted: (Y/N) Date Received: 06/07/2012
Extraction: (Type) SEPF Date Extracted: 06/07/2012
Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/15/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 20.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	4.6	P D

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1344

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11150-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 11JUN121847-R051.D

% Moisture: Decanted: (Y/N) Date Received: 06/07/2012

Extraction: (Type) SEPF Date Extracted: 06/07/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/11/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.95	U
11104-28-2	Aroclor-1221	0.95	U
11141-16-5	Aroclor-1232	0.95	U
53469-21-9	Aroclor-1242	0.95	U
12672-29-6	Aroclor-1248	0.95	U
11097-69-1	Aroclor-1254	0.95	U
11096-82-5	Aroclor-1260	0.95	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-11150-2

SDG No.: PRR1344

Client Sample ID: PRR1WATCME-63 | Lab Sample ID: 200-11150-1

Matrix: Water | Lab File ID: 08jun121209-r061.d

Analysis Method: 8151A | Date Collected: 06/06/2012 10:28

Extraction Method: 8151A | Date Extracted: 06/07/2012 15:05

Sample wt/vol: 1050(mL) | Date Analyzed: 06/08/2012 15:44

Con. Extract Vol.: 10000(uL) | Dilution Factor: 5000

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 40155 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	8100	U J	8100	2200
88-85-7	Dinoseb	4500	U ↓	4500	900

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 200-11150-2
SDG No.: PRR1344
Client Sample ID: PRR1WATCME-63
Lab Sample ID: 200-11150-1
Matrix: Water
Lab File ID: 08jun121209-r061.d
Analysis Method: 8151A
Date Collected: 06/06/2012 10:28
Extraction Method: 8151A
Date Extracted: 06/07/2012 15:05
Sample wt/vol: 1050(mL)
Date Analyzed: 06/08/2012 15:44
Con. Extract Vol.: 10000(uL)
Dilution Factor: 5000
Injection Volume: 1(uL)
GC Column: RTX-CLPII ID: 0.32(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 40155
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	85000	J	9000	3100
93-76-5	2,4,5-T	1600	J	2200	620

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	x	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 200-11150-2
SDG No.: PRR1344
Client Sample ID: PRR1WATCMI-63
Lab Sample ID: 200-11150-2
Matrix: Water
Lab File ID: 08jun121209-r051.d
Analysis Method: 8151A
Date Collected: 06/06/2012 13:00
Extraction Method: 8151A
Date Extracted: 06/07/2012 15:05
Sample wt/vol: 1045(mL)
Date Analyzed: 06/08/2012 15:17
Con. Extract Vol.: 10000(uL)
Dilution Factor: 2500
Injection Volume: 1(uL)
GC Column: RTX-CLP ID: 0.32(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 40155
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	8000	J	1100	310

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington
Job No.: 200-11150-2
SDG No.: PRR1344
Client Sample ID: PRR1WATCMI-63
Lab Sample ID: 200-11150-2
Matrix: Water
Lab File ID: 08jun121209-r051.d
Analysis Method: 8151A
Date Collected: 06/06/2012 13:00
Extraction Method: 8151A
Date Extracted: 06/07/2012 15:05
Sample wt/vol: 1045(mL)
Date Analyzed: 06/08/2012 15:17
Con. Extract Vol.: 10000(uL)
Dilution Factor: 2500
Injection Volume: 1(uL)
GC Column: RTX-CLPII ID: 0.32(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 40155
Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1344
Matrix: WATER Lab Sample Id: 200-11150-1
% Solids: Date Received: 06/07/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	10.9			MS
7440-38-2	Arsenic	9.5			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	1.8	J		MS
7440-50-8	Copper	1.9	J		MS
7439-92-1	Lead	1.0 ~~0.57~~	~~J~~	JB	MS
7440-02-0	Nickel	17.2		#J	MS
7782-49-2	Selenium	11.6		J	MS
7440-22-4	Silver	0.41	J		MS
7440-66-6	Zinc	6.1		UB	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI
Mod. Ref. No.: SDG No.: PRR1344
Matrix: WATER
Lab Sample Id: 200-11150-1
% Solids:
Date Received: 06/07/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.18	J		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-63

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI
Mod. Ref. No.: SDG No.: PRR1344
Matrix: WATER
Lab Sample Id: 200-11150-1
% Solids:
Date Received: 06/07/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	3.9	J		AS

Color Before: WHITE
Clarity Before: CLOUDY
Texture:
Color After:
Clarity After:
Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-63
Lab Sample ID: 200-11150-1
Lab Name: TestAmerica Burlington
Job No.: 200-11150-2
SDG ID.: PRR1344
Matrix: Water
Date Sampled: 06/06/2012 10:28
Reporting Basis: WET
Date Received: 06/07/2012 09:05

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	110	10.0	1.4	mg/L			10	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-63
Lab Sample ID: 200-11150-1
Lab Name: TestAmerica Burlington
Job No.: 200-11150-3
SDG ID.: PRR1344
Matrix: Water
Date Sampled: 06/06/2012 10:28
Reporting Basis: WET
Date Received: 06/07/2012 09:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.4	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-62 | Lab Sample ID: 200-11150-3

Lab Name: TestAmerica Burlington | Job No.: 200-11150-3

SDG ID.: PRR1344

Matrix: Water | Date Sampled: 06/05/2012 14:15

Reporting Basis: WET | Date Received: 06/07/2012 09:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.8	1.9		mg/L			1	SM 2540D

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1344 (33824)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #16602R
Project: B0009964.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) #PR1344 (33824) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	PEST	PCBs	PCDD/ PCDF	MISC
PRR1WATCME-63	33824-001	Water	6/6/2012				X	X	
PRR1WATCMI-63	33824-002	Water	6/6/2012				X	X	

1. PCDD/PCDF – Dioxins/Furans by USEPA 1613
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

The compound 2,3,7,8-TCDF was detected in the samples. Confirmation analysis was performed for sample location PRR1WATCMI-63, that exhibited a concentration greater than the PQL.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias - The method blank exhibited concentrations greater than the RL for many congeners. The sample concentrations were greater than five times the method blank concentration. See Section 2.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

The method blanks exhibited concentrations greater than the RL for many of the PCB congeners. The sample concentrations were greater than five times the method blank concentration. Therefore, detected sample results were not associated with laboratory contamination and resulted in the removal of the laboratory qualifier (B).

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory added the qualifier "I" which is defined by the laboratory as "Chemical Interference." These samples results were qualified as estimated (J).

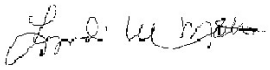
The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Lyndi Mott
Data Quality Specialist

SIGNATURE:



DATE: July 1, 2012

PEER REVIEW BY: Dennis Capria

DATE: July 2, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - PCB Congeners

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
PCB-1	pg/L	67.4			126000		
PCB-2	pg/L	54.5			58800		
PCB-3	pg/L	48			39900		
PCB-4/10	pg/L	38.4			21900		
PCB-5/8	pg/L	123			49400		
PCB-6	pg/L	43			12200		
PCB-7/9	pg/L	69.2			27100		
PCB-11	pg/L	125			9400		
PCB-12/13	pg/L	145			65000		
PCB-14	pg/L	53.7			24200		
PCB-15	pg/L	35.9			10600		
PCB-16/32	pg/L	54.5			15300		
PCB-17	pg/L	35.1			9620		
PCB-18	pg/L	105			28100		
PCB-19	pg/L	8.85			2470		
PCB-20/21/33	pg/L	108			22800		
PCB-22	pg/L	50.4			11600		
PCB-23	pg/L	12.4			2070		
PCB-24/27	pg/L	27.5			7990		
PCB-25	pg/L	10.5			2190		
PCB-26	pg/L	24.9			5030		
PCB-28	pg/L	120			29600		
PCB-29	pg/L	6.31			1170		
PCB-30	pg/L	4.8	U	U	434		
PCB-31	pg/L	137			29200		
PCB-34	pg/L	9.81			1510		
PCB-35	pg/L	13.9			2360		
PCB-36	pg/L	5.53			830		
PCB-37	pg/L	80.7			12300		
PCB-38	pg/L	4.8	U	U	329	U,I	UJ
PCB-39	pg/L	14.6			2040		
PCB-40	pg/L	27.1			3540		
PCB-41/64/71/72	pg/L	141			21900		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - PCB Congeners

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
PCB-42/59	pg/L	46.7			6440		
PCB-43/49	pg/L	118			15700		
PCB-44	pg/L	153			22100		
PCB-45	pg/L	21.2			3650		
PCB-46	pg/L	10.1			1550		
PCB-47	pg/L	39.2			5080		
PCB-48/75	pg/L	34.6			4490		
PCB-50	pg/L	4.8	U	U	82.1	J	J
PCB-51	pg/L	8.01			1100		
PCB-52/69	pg/L	172			22800		
PCB-53	pg/L	22.8			3540		
PCB-54	pg/L	4.8	U	U	68.9	J	J
PCB-55	pg/L	4.8	U	U	335		
PCB-56/60	pg/L	99.8			13600		
PCB-57	pg/L	4.8	U	U	111		
PCB-58	pg/L	4.8	U	U	60.5	J	J
PCB-61/70	pg/L	197			23900		
PCB-62	pg/L	4.8	U	U	33.7	J	J
PCB-63	pg/L	8.96			817		
PCB-65	pg/L	4.8	U	U	96.7	U	U
PCB-67	pg/L	5.52			651		
PCB-68	pg/L	4.8	U	U	124		
PCB-73	pg/L	4.8	U	U	68.6	J	J
PCB-74	pg/L	96.5			12100		
PCB-76/66	pg/L	144			17900		
PCB-77	pg/L	19.2	B		1710	B	
PCB-78	pg/L	4.8	U	U	96.7	U	U
PCB-79	pg/L	4.8	U	U	433	U,I	UJ
PCB-80	pg/L	4.8	U	U	48.1	J	J
PCB-81	pg/L	3.79	U,*	U	85.5	J	J
PCB-82	pg/L	35.5			2290		
PCB-83	pg/L	4.8	U	U	24.3	J	J
PCB-84/92	pg/L	112	B		7350	B	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - PCB Congeners

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
PCB-85/116	pg/L	50.7			3860		
PCB-86	pg/L	4.9			245		
PCB-87/117/125	pg/L	97.9	B		6480	B	
PCB-88/91	pg/L	40.3			3320		
PCB-89	pg/L	4.89			371		
PCB-90/101	pg/L	274	B		16800	B	
PCB-93	pg/L	4.8	U	U	96.7	U	U
PCB-94	pg/L	4.8	U	U	142		
PCB-95/98/102	pg/L	192	B		15100	B	
PCB-96	pg/L	4.8	U	U	203	U,I	UJ
PCB-97	pg/L	83.1			5320		
PCB-99	pg/L	139			7750		
PCB-100	pg/L	4.8	U	U	95.1	J	J
PCB-103	pg/L	4.8	U	U	157		
PCB-104	pg/L	4.8	U	U	96.7	U	U
PCB-105	pg/L	96.5			5860		
PCB-106/118	pg/L	275	B		15300	B	
PCB-107/109	pg/L	20.1			1060		
PCB-108/112	pg/L	13.1			809		
PCB-110	pg/L	297	B		21000	B	
PCB-111/115	pg/L	7.68			441		
PCB-113	pg/L	4.8	U	U	96.7	U	U
PCB-114	pg/L	18.4	U,I	UJ	1030		
PCB-119	pg/L	6.85			370		
PCB-120	pg/L	4.8	U	U	83.5	J	J
PCB-121	pg/L	4.8	U	U	96.7	U	U
PCB-122	pg/L	4.8	U	U	186	U,I	UJ
PCB-123	pg/L	6.28			340		
PCB-124	pg/L	12.9			619		
PCB-126	pg/L	3.33	J	J	135		
PCB-127	pg/L	4.8	U	U	96.7	U	U
PCB-128/162	pg/L	57.4			1850		
PCB-129	pg/L	19.5			700		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - PCB Congeners

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
PCB-130	pg/L	22.5			745		
PCB-131	pg/L	4.8	U	U	96.7	U	U
PCB-132/161	pg/L	99.1			3830		
PCB-133/142	pg/L	11.5			388		
PCB-134/143	pg/L	19.3			734		
PCB-135	pg/L	40			1110		
PCB-136	pg/L	44.3			1860		
PCB-137	pg/L	22.8			778		
PCB-138/163/164	pg/L	367	B		12700	B	
PCB-139/149	pg/L	236			7580		
PCB-140	pg/L	4.8	U	U	96.7	U	U
PCB-141	pg/L	81.2			2880		
PCB-144	pg/L	13.8			483		
PCB-145	pg/L	4.8	U	U	96.7	U	U
PCB-146/165	pg/L	52			1690		
PCB-147	pg/L	7.4			213		
PCB-148	pg/L	4.8	U	U	96.7	U	U
PCB-150	pg/L	4.8	U	U	96.7	U	U
PCB-151	pg/L	64.2			2040		
PCB-152	pg/L	4.8	U	U	96.7	U	U
PCB-153	pg/L	361	B		12000	B	
PCB-154	pg/L	7.57			199		
PCB-155	pg/L	4.8	U	U	96.7	U	U
PCB-156	pg/L	67.6			2120		
PCB-157	pg/L	13.5			365		
PCB-158/160	pg/L	45.4			1550		
PCB-159	pg/L	4.8	U	U	96.7	U	U
PCB-166	pg/L	6			194		
PCB-167	pg/L	22.2			649		
PCB-168	pg/L	4.8	U	U	27.3	J	J
PCB-169	pg/L	1.11	U,*	U	42.4	U,*	U
PCB-170	pg/L	139			2910		
PCB-171	pg/L	34.5			826		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - PCB Congeners

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
PCB-172	pg/L	26.4			566		
PCB-173	pg/L	4.8	U	U	103		
PCB-174	pg/L	166			3690		
PCB-175	pg/L	8.19			182		
PCB-176	pg/L	20.1			532		
PCB-177	pg/L	85.2			1790		
PCB-178	pg/L	35.2			718		
PCB-179	pg/L	80			1750		
PCB-180	pg/L	408			8450		
PCB-181	pg/L	4.8	U	U	39.7	J	J
PCB-182/187	pg/L	235			4830		
PCB-183	pg/L	94.4			2070		
PCB-184	pg/L	4.8	U	U	31.7	J	J
PCB-185	pg/L	23.9			523		
PCB-186	pg/L	4.8	U	U	96.7	U	U
PCB-188	pg/L	4.8	U	U	24.8	J	J
PCB-189	pg/L	16.7	B		395	B	
PCB-190	pg/L	48.6			1080	U,I	UJ
PCB-191	pg/L	6.56			159		
PCB-192	pg/L	4.8	U	U	12	J	J
PCB-193	pg/L	16.7			355		
PCB-194	pg/L	189			2850		
PCB-195	pg/L	57.7			898		
PCB-196/203	pg/L	262			4180		
PCB-197	pg/L	8.12			112		
PCB-198	pg/L	15.1			224		
PCB-199	pg/L	279			3880		
PCB-200	pg/L	25.3			372		
PCB-201	pg/L	30.9			458		
PCB-202	pg/L	95.3			1280		
PCB-204	pg/L	4.8	U	U	96.7	U	U
PCB-205	pg/L	33.8	U,I	UJ	661	U,I	UJ
PCB-206	pg/L	435			5640		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - PCB Congeners

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
PCB-207	pg/L	41.4			602		
PCB-208	pg/L	162			1770		
PCB-209	pg/L	1940			77400		
Total monoCB	pg/L	170			224000		
Total diCB	pg/L	633			220000		
Total triCB	pg/L	824			187000		
Total tetraCB	pg/L	1360	B		184000	B	
Total pentaCB	pg/L	1770	B		116000	B	
Total hexaCB	pg/L	1680	B		56800	B	
Total heptaCB	pg/L	1440	B		30000	B	
Total octaCB	pg/L	963			14300		
Total nonaCB	pg/L	638			8010		
Total decaCB	pg/L	1940			77400		
Total PCB	pg/L	11400	B		1120000	B	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1344 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-63	LQ	VQ	PRR1WATCMI-63	LQ	VQ
2,3,7,8-TCDD	pg/L	295			15300	E	EJ
1,2,3,7,8-PeCDD	pg/L	3.6	EMPC	EMPC	110		
1,2,3,4,7,8-HxCDD	pg/L	2.55	U	U	34.9		
1,2,3,6,7,8-HxCDD	pg/L	5.76	J	J	139		
1,2,3,7,8,9-HxCDD	pg/L	3.02	U	U	59.9		
1,2,3,4,6,7,8-HpCDD	pg/L	14.7	EMPC	EMPC	317		
OCDD	pg/L	354			17400		
Total TCDD	pg/L	832			51500		
Total PeCDD	pg/L	42.8			2840		
Total HxCDD	pg/L	38.7			1060		
Total HpCDD	pg/L	22.7			752		
2,3,7,8-TCDF	pg/L	3.11	J	J	177		
1,2,3,7,8-PeCDF	pg/L	5.66	J	J	169		
2,3,4,7,8-PeCDF	pg/L	30.3			1090		
1,2,3,4,7,8-HxCDF	pg/L	262			6440		
1,2,3,6,7,8-HxCDF	pg/L	39.8			1000		
1,2,3,7,8,9-HxCDF	pg/L	5.56	J	J	44.6		
2,3,4,6,7,8-HxCDF	pg/L	17.7	J	J	466		
1,2,3,4,6,7,8-HpCDF	pg/L	487			15000		
1,2,3,4,7,8,9-HpCDF	pg/L	30.6			794		
OCDF	pg/L	1320			65700	E	EJ
Total TCDF	pg/L	2260			118000		
Total PeCDF	pg/L	885			34177		
Total HxCDF	pg/L	563			13900		
Total HpCDF	pg/L	606			17900		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	347			16800		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1WATCME-63 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33824-001	Date Received:	7-Jun-12
Project:	PRR1344	Sample Size:	1.03 L	QC Batch No.:	4487	Date Extracted:	7-Jun-12
Date Collected:	6-Jun-12			Date Analyzed DB-5:	8-Jun-12	Date Analyzed DB-225:	NA
Time Collected:	1028						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	295			
1,2,3,7,8-PeCDD	ND		3.60	
1,2,3,4,7,8-HxCDD	ND	2.55		
1,2,3,6,7,8-HxCDD	5.76			J
1,2,3,7,8,9-HxCDD	ND	3.02		
1,2,3,4,6,7,8-HpCDD	ND		14.7	
OCDD	354			
2,3,7,8-TCDF	3.11			J
1,2,3,7,8-PeCDF	5.66			J
2,3,4,7,8-PeCDF	30.3			
1,2,3,4,7,8-HxCDF	262			
1,2,3,6,7,8-HxCDF	39.8			
2,3,4,6,7,8-HxCDF	17.7			J
1,2,3,7,8,9-HxCDF	5.56			J
1,2,3,4,6,7,8-HpCDF	487			
1,2,3,4,7,8,9-HpCDF	30.6			
OCDF	1320			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	79.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	78.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	75.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	70.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	72.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	64.7	23 - 140	
	13C-OCDD	59.9	17 - 157	
	13C-2,3,7,8-TCDF	75.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	76.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	76.6	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	77.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	71.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	73.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	69.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	62.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	64.7	26 - 138	
	13C-OCDF	60.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	98.3	35 - 197	

Totals		
Total TCDD	832	833
Total PeCDD	42.8	73.3
Total HxCDD	38.7	
Total HpCDD	22.7	37.3
Total TCDF	2260	2300
Total PeCDF	885	
Total HxCDF	563	
Total HpCDF	606	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 343

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 12-Jun-2012 15:07

Sample ID:	PRR1WATCMI-63				EPA Method 1613
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33824-002
Project:	PRR1344	Sample Size:	1.02 L	QC Batch No.:	4487
Date Collected:	6-Jun-12			Date Analyzed DB-5:	8-Jun-12
Time Collected:	1300				
				Date Received:	7-Jun-12
				Date Extracted:	7-Jun-12
				Dates Analyzed DB-225:	11-Jun-12

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	15300			E J
1,2,3,7,8-PeCDD	110			
1,2,3,4,7,8-HxCDD	34.9			
1,2,3,6,7,8-HxCDD	139			
1,2,3,7,8,9-HxCDD	59.9			
1,2,3,4,6,7,8-HpCDD	317			
OCDD	17400			
2,3,7,8-TCDF	177			
1,2,3,7,8-PeCDF	169			
2,3,4,7,8-PeCDF	1090			
1,2,3,4,7,8-HxCDF	6440			
1,2,3,6,7,8-HxCDF	1000			
2,3,4,6,7,8-HxCDF	466			
1,2,3,7,8,9-HxCDF	44.6			
1,2,3,4,6,7,8-HpCDF	15000			
1,2,3,4,7,8,9-HpCDF	794			
OCDF	65700			E J

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	97.2	25 - 164	
	13C-1,2,3,7,8-PeCDD	83.7	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	85.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	82.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	81.0	23 - 140	
	13C-OCDD	79.6	17 - 157	
	13C-2,3,7,8-TCDF	85.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	81.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	79.6	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	94.8	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	88.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	84.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	81.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	82.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	81.9	26 - 138	
	13C-OCDF	96.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	129	35 - 197	

Totals		
Total TCDD	51500	51500
Total PeCDD	2840	2870
Total HxCDD	1060	
Total HpCDD	752	
Total TCDF	118000	
Total PeCDF	34200	34200
Total HxCDF	13900	14000
Total HpCDF	17900	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 16800

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 12-Jun-2012 15:07

Sample ID:	PRR1WATCME-63		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33824-001
Project:	PRR1344	Sample Size: 1.04 L	QC Batch No.: 4488
Date Collected:	6-Jun-12	%Solids: 0.758	Date Analyzed DB-1 8-Jun-12
Time Collected:	1028		Date Received: 7-Jun-12
			Date Extracted: 7-Jun-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	67.4	4.80	
PCB-2	54.5	4.80	
PCB-3	48.0	4.80	
PCB-4/10	38.4	9.61	
PCB-5/8	123	9.61	
PCB-6	43.0	9.61	
PCB-7/9	69.2	9.61	
PCB-11	125	9.61	
PCB-12/13	145	9.61	
PCB-14	53.7	9.61	
PCB-15	35.9	9.61	
PCB-16/32	54.5	4.80	
PCB-17	35.1	4.80	
PCB-18	105	4.80	
PCB-19	8.85	4.80	
PCB-20/21/33	108	4.80	
PCB-22	50.4	4.80	
PCB-23	12.4	4.80	
PCB-24/27	27.5	4.80	
PCB-25	10.5	4.80	
PCB-26	24.9	4.80	
PCB-28	120	4.80	
PCB-29	6.31	4.80	
PCB-30	ND	4.80	
PCB-31	137	4.80	
PCB-34	9.81	4.80	
PCB-35	13.9	4.80	
PCB-36	5.53	4.80	
PCB-37	80.7	4.80	
PCB-38	ND	4.80	
PCB-39	14.6	4.80	
PCB-40	27.1	4.80	
PCB-41/64/71/72	141	4.80	
PCB-42/59	46.7	4.80	
PCB-43/49	118	4.80	
PCB-44	153	4.80	
PCB-45	21.2	4.80	
PCB-46	10.1	4.80	
PCB-47	39.2	4.80	
PCB-48/75	34.6	4.80	
PCB-50	ND	4.80	
PCB-51	8.01	4.80	
PCB-52/69	172	4.80	
PCB-53	22.8	4.80	
PCB-54	ND	4.80	
PCB-55	ND	4.80	
PCB-56/60	99.8	4.80	
PCB-57	ND	4.80	
PCB-58	ND	4.80	
PCB-61/70	197	4.80	
PCB-62	ND	4.80	
PCB-63	8.96	4.80	
PCB-65	ND	4.80	
PCB-67	5.52	4.80	
PCB-68	ND	4.80	
PCB-73	ND	4.80	
PCB-74	96.5	4.80	
PCB-76/66	144	4.80	
PCB-77	19.2	4.80	~~B~~
PCB-78	ND	4.80	
PCB-79	ND	4.80	
PCB-80	ND	4.80	
PCB-81	ND	3.79	~~*~~
PCB-82	35.5	4.80	

Sample ID:	PRR1WATCME-63			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33824-001	Date Received: 7-Jun-12
Project:	PRR1344	Sample Size: 1.04 L	QC Batch No.: 4488	Date Extracted: 7-Jun-12
Date Collected:	6-Jun-12	%Solids: 0.758	Date Analyzed DB-1 8-Jun-12	
Time Collected:	1028			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.80		PCB-127	ND	4.80	
PCB-84/92	112	4.80	~~B~~	PCB-128/162	57.4	4.80	
PCB-85/116	50.7	4.80		PCB-129	19.5	4.80	
PCB-86	4.90	4.80		PCB-130	22.5	4.80	
PCB-87/117/125	97.9	4.80	~~B~~	PCB-131	ND	4.80	
PCB-88/91	40.3	4.80		PCB-132/161	99.1	4.80	
PCB-89	4.89	4.80		PCB-133/142	11.5	4.80	
PCB-90/101	274	4.80	~~B~~	PCB-134/143	19.3	4.80	
PCB-93	ND	4.80		PCB-135	40.0	4.80	
PCB-94	ND	4.80		PCB-136	44.3	4.80	
PCB-95/98/102	192	4.80	~~B~~	PCB-137	22.8	4.80	
PCB-96	ND	4.80		PCB-138/163/164	367	4.80	~~B~~
PCB-97	83.1	4.80		PCB-139/149	236	4.80	
PCB-99	139	4.80		PCB-140	ND	4.80	
PCB-100	ND	4.80		PCB-141	81.2	4.80	
PCB-103	ND	4.80		PCB-144	13.8	4.80	
PCB-104	ND	4.80		PCB-145	ND	4.80	
PCB-105	96.5	4.80		PCB-146/165	52.0	4.80	
PCB-106/118	275	4.80	~~B~~	PCB-147	7.40	4.80	
PCB-107/109	20.1	4.80		PCB-148	ND	4.80	
PCB-108/112	13.1	4.80		PCB-150	ND	4.80	
PCB-110	297	4.80	~~B~~	PCB-151	64.2	4.80	
PCB-111/115	7.68	4.80		PCB-152	ND	4.80	
PCB-113	ND	4.80		PCB-153	361	4.80	~~B~~
PCB-114	ND	18.4	~~I~~ J	PCB-154	7.57	4.80	
PCB-119	6.85	4.80		PCB-155	ND	4.80	
PCB-120	ND	4.80		PCB-156	67.6	4.80	
PCB-121	ND	4.80		PCB-157	13.5	4.80	
PCB-122	ND	4.80		PCB-158/160	45.4	4.80	
PCB-123	6.28	4.80		PCB-159	ND	4.80	
PCB-124	12.9	4.80		PCB-166	6.00	4.80	
PCB-126	3.33	4.80	J	PCB-167	22.2	4.80	

Sample ID:	PRR1WATCME-63		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33824-001
Project:	PRR1344	Sample Size: 1.04 L	QC Batch No.: 4488
Date Collected:	6-Jun-12	%Solids: 0.758	Date Analyzed DB-1 8-Jun-12
Time Collected:	1028		Date Received: 7-Jun-12
			Date Extracted: 7-Jun-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	4.80	
PCB-169	ND	1.11	~~*~~
PCB-170	139	4.80	
PCB-171	34.5	4.80	
PCB-172	26.4	4.80	
PCB-173	ND	4.80	
PCB-174	166	4.80	
PCB-175	8.19	4.80	
PCB-176	20.1	4.80	
PCB-177	85.2	4.80	
PCB-178	35.2	4.80	
PCB-179	80.0	4.80	
PCB-180	408	4.80	
PCB-181	ND	4.80	
PCB-182/187	235	4.80	
PCB-183	94.4	4.80	
PCB-184	ND	4.80	
PCB-185	23.9	4.80	
PCB-186	ND	4.80	
PCB-188	ND	4.80	
PCB-189	16.7	4.80	~~B~~
PCB-190	48.6	4.80	
PCB-191	6.56	4.80	
PCB-192	ND	4.80	
PCB-193	16.7	4.80	
PCB-194	189	4.80	
PCB-195	57.7	4.80	
PCB-196/203	262	4.80	
PCB-197	8.12	4.80	
PCB-198	15.1	4.80	
PCB-199	279	4.80	
PCB-200	25.3	4.80	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	30.9	4.80	
PCB-202	95.3	4.80	
PCB-204	ND	4.80	
PCB-205	ND	33.8	~~I~~ J
PCB-206	435	4.80	
PCB-207	41.4	4.80	
PCB-208	162	4.80	
PCB-209	1940	4.80	
Total monoCB	170	4.80	
Total diCB	633	9.61	
Total triCB	824	4.80	
Total tetraCB	1360	4.80	~~B~~
Total pentaCB	1770	4.80	~~B~~
Total hexaCB	1680	4.80	~~B~~
Total heptaCB	1440	4.80	~~B~~
Total octaCB	963	4.80	
Total nonaCB	638	4.80	
Total decaCB	1940	4.80	
Total PCB	11400	9.61	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: 0.350

Sample ID:	PRR1WATCMI-63			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33824-002	Date Received: 7-Jun-12
Project:	PRR1344	Sample Size: 1.03 L	QC Batch No.: 4488	Date Extracted: 7-Jun-12
Date Collected:	6-Jun-12	%Solids: 0.983	Date Analyzed DB-1 8-Jun-12	
Time Collected:	1300			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	126000	96.7		PCB-41/64/71/72	21900	96.7	
PCB-2	58800	96.7		PCB-42/59	6440	96.7	
PCB-3	39900	96.7		PCB-43/49	15700	96.7	
PCB-4/10	21900	193		PCB-44	22100	96.7	
PCB-5/8	49400	193		PCB-45	3650	96.7	
PCB-6	12200	193		PCB-46	1550	96.7	
PCB-7/9	27100	193		PCB-47	5080	96.7	
PCB-11	9400	193		PCB-48/75	4490	96.7	
PCB-12/13	65000	193		PCB-50	82.1	96.7	J
PCB-14	24200	193		PCB-51	1100	96.7	
PCB-15	10600	193		PCB-52/69	22800	96.7	
PCB-16/32	15300	96.7		PCB-53	3540	96.7	
PCB-17	9620	96.7		PCB-54	68.9	96.7	J
PCB-18	28100	96.7		PCB-55	335	96.7	
PCB-19	2470	96.7		PCB-56/60	13600	96.7	
PCB-20/21/33	22800	96.7		PCB-57	111	96.7	
PCB-22	11600	96.7		PCB-58	60.5	96.7	J
PCB-23	2070	96.7		PCB-61/70	23900	96.7	
PCB-24/27	7990	96.7		PCB-62	33.7	96.7	J
PCB-25	2190	96.7		PCB-63	817	96.7	
PCB-26	5030	96.7		PCB-65	ND	96.7	
PCB-28	29600	96.7		PCB-67	651	96.7	
PCB-29	1170	96.7		PCB-68	124	96.7	
PCB-30	434	96.7		PCB-73	68.6	96.7	J
PCB-31	29200	96.7		PCB-74	12100	96.7	
PCB-34	1510	96.7		PCB-76/66	17900	96.7	
PCB-35	2360	96.7		PCB-77	1710	96.7	~~B~~
PCB-36	830	96.7		PCB-78	ND	96.7	
PCB-37	12300	96.7		PCB-79	ND	433	~~J~~ J
PCB-38	ND	329	~~J~~ J	PCB-80	48.1	96.7	J
PCB-39	2040	96.7		PCB-81	85.5	96.7	J
PCB-40	3540	96.7		PCB-82	2290	96.7	

Sample ID:	PRR1WATCMI-63			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33824-002	Date Received: 7-Jun-12
Project:	PRR1344	Sample Size: 1.03 L	QC Batch No.: 4488	Date Extracted: 7-Jun-12
Date Collected:	6-Jun-12	%Solids: 0.983	Date Analyzed DB-1 8-Jun-12	
Time Collected:	1300			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	24.3	96.7	J	PCB-127	ND	96.7	
PCB-84/92	7350	96.7	~~B~~	PCB-128/162	1850	96.7	
PCB-85/116	3860	96.7		PCB-129	700	96.7	
PCB-86	245	96.7		PCB-130	745	96.7	
PCB-87/117/125	6480	96.7	~~B~~	PCB-131	ND	96.7	
PCB-88/91	3320	96.7		PCB-132/161	3830	96.7	
PCB-89	371	96.7		PCB-133/142	388	96.7	
PCB-90/101	16800	96.7	~~B~~	PCB-134/143	734	96.7	
PCB-93	ND	96.7		PCB-135	1110	96.7	
PCB-94	142	96.7		PCB-136	1860	96.7	
PCB-95/98/102	15100	96.7	~~B~~	PCB-137	778	96.7	
PCB-96	ND	203	~~I~~ J	PCB-138/163/164	12700	96.7	~~B~~
PCB-97	5320	96.7		PCB-139/149	7580	96.7	
PCB-99	7750	96.7		PCB-140	ND	96.7	
PCB-100	95.1	96.7	J	PCB-141	2880	96.7	
PCB-103	157	96.7		PCB-144	483	96.7	
PCB-104	ND	96.7		PCB-145	ND	96.7	
PCB-105	5860	96.7		PCB-146/165	1690	96.7	
PCB-106/118	15300	96.7	~~B~~	PCB-147	213	96.7	
PCB-107/109	1060	96.7		PCB-148	ND	96.7	
PCB-108/112	809	96.7		PCB-150	ND	96.7	
PCB-110	21000	96.7	~~B~~	PCB-151	2040	96.7	
PCB-111/115	441	96.7		PCB-152	ND	96.7	
PCB-113	ND	96.7		PCB-153	12000	96.7	~~B~~
PCB-114	1030	96.7		PCB-154	199	96.7	
PCB-119	370	96.7		PCB-155	ND	96.7	
PCB-120	83.5	96.7	J	PCB-156	2120	96.7	
PCB-121	ND	96.7		PCB-157	365	96.7	
PCB-122	ND	186	~~I~~ J	PCB-158/160	1550	96.7	
PCB-123	340	96.7		PCB-159	ND	96.7	
PCB-124	619	96.7		PCB-166	194	96.7	
PCB-126	135	96.7		PCB-167	649	96.7	

Sample ID:	PRR1WATCMI-63		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33824-002
Project:	PRR1344	Sample Size: 1.03 L	QC Batch No.: 4488
Date Collected:	6-Jun-12	%Solids: 0.983	Date Analyzed DB-1 8-Jun-12
Time Collected:	1300		Date Received: 7-Jun-12
			Date Extracted: 7-Jun-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	27.3	96.7	J
PCB-169	ND	42.4	~~J~~
PCB-170	2910	96.7	
PCB-171	826	96.7	
PCB-172	566	96.7	
PCB-173	103	96.7	
PCB-174	3690	96.7	
PCB-175	182	96.7	
PCB-176	532	96.7	
PCB-177	1790	96.7	
PCB-178	718	96.7	
PCB-179	1750	96.7	
PCB-180	8450	96.7	
PCB-181	39.7	96.7	J
PCB-182/187	4830	96.7	
PCB-183	2070	96.7	
PCB-184	31.7	96.7	J
PCB-185	523	96.7	
PCB-186	ND	96.7	
PCB-188	24.8	96.7	J
PCB-189	395	96.7	~~B~~
PCB-190	ND	1080	~~J~~ J
PCB-191	159	96.7	
PCB-192	12.0	96.7	J
PCB-193	355	96.7	
PCB-194	2850	96.7	
PCB-195	898	96.7	
PCB-196/203	4180	96.7	
PCB-197	112	96.7	
PCB-198	224	96.7	
PCB-199	3880	96.7	
PCB-200	372	96.7	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	458	96.7	
PCB-202	1280	96.7	
PCB-204	ND	96.7	
PCB-205	ND	661	~~J~~ J
PCB-206	5640	96.7	
PCB-207	602	96.7	
PCB-208	1770	96.7	
PCB-209	77400	96.7	
Total monoCB	224000	96.7	
Total diCB	220000	193	
Total triCB	187000	96.7	
Total tetraCB	184000	96.7	~~B~~
Total pentaCB	116000	96.7	~~B~~
Total hexaCB	56800	96.7	~~B~~
Total heptaCB	30000	96.7	~~B~~
Total octaCB	14300	96.7	
Total nonaCB	8010	96.7	
Total decaCB	77400	96.7	
Total PCB	1120000	193	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: **14.5**

ARCADIS
Infrastructure, environment, buildings

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33824 1.9°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1344	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-63	6/6/2012	10:28	water	Grab	4	X	X																
PRR1WATCMI-63	6/6/2012	13:00	water	Grab	4	X	X																

	Requested Analyses
1	Dioxins
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig L. Brumph	6/6/12	1430	Bethnie L. Benedict 6/7/12 0800			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1165 (200-9935)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17089R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1165 (200-9935) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-01	200-9935-1	Water	3/20/2012		X				X[1]
PRR1WATGACE-01	200-9935-2	Water	3/20/2012		X				X[1]
TB3202012	200-9935-3	Water	3/20/2012		X				
PRR1WATCME-01	460-38129-1	Water	3/19/2012						X[2]
PRR1WATCME-02	460-38129-2	Water	3/20/2012						X[2]

1. Miscellaneous parameters include Chemical Oxygen Demand (COD) by EPA Method 410.4
2. Miscellaneous parameters include Total Suspended Solids (TSS).
3. Volatiles by USEPA SOM0.1.2.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Compounds 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. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-01	Chlorobenzene	50 E	54 D	54 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

COD and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during COD and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

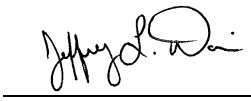
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 27, 2012

PEER REVIEW: Dennis Capria

DATE: September 26, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1165 - VOCs

ANALYTE	Units	PRR1WATGACE-01	LQ	VQ	PRR1WATGACI-01	LQ	VQ
2-Butanone	ug/L	5	U	U	4.5	J	J
Chlorobenzene	ug/L	0.5	U	U	54	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1165 - Miscellaneous

ANALYTE	Units	PRR1WATCME-01	LQ	VQ	PRR1WATCME-02	LQ	VQ	PRR1WATGACE-01	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			706		
Total Suspended Solids	mg/L	14			4			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1165 - Miscellaneous

ANALYTE	Units	PRR1WATGACI-01	LQ	VQ
Chemical Oxygen Demand	mg/L	415		
Total Suspended Solids	mg/L	NA		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	4.5	J
108-90-7	Chlorobenzene	54 ~~50~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-01DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 4.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	20	U
108-90-7	Chlorobenzene	54	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB3202012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-01
Lab Sample ID: 460-38129-1
Lab Name: TestAmerica Edison
Job No.: 460-38129-1
SDG ID.:
Matrix: Water
Date Sampled: 03/19/2012 23:00
Reporting Basis: WET
Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	14.0	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-02 Lab Sample ID: 460-38129-2

Lab Name: TestAmerica Edison Job No.: 460-38129-1

SDG ID.:

Matrix: Water Date Sampled: 03/20/2012 16:40

Reporting Basis: WET Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	4.0	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-01 Lab Sample ID: 460-38129-3

Lab Name: TestAmerica Edison Job No.: 460-38129-1

SDG ID.:

Matrix: Water Date Sampled: 03/20/2012 16:50

Reporting Basis: WET Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	Chemical Oxygen Demand	415	10.0	5.9	mg/L			1	SM 5220D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-01 Lab Sample ID: 460-38129-4

Lab Name: TestAmerica Edison Job No.: 460-38129-1

SDG ID.:

Matrix: Water Date Sampled: 03/20/2012 17:00

Reporting Basis: WET Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	Chemical Oxygen Demand	706	10.0	5.9	mg/L			1	SM 5220D

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1165	

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-01	3/20/2012	1655	water	Grab	3	X																	
PRR1WATGACE-01	3/20/2012	1705	water	Grab	3	X																	
TB03202012	3/20/2012	1710	water	—	3	X																	

Page 8 of 111

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 4.0

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/20/12	1745	MAS			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	03/20/12	1900	[signature] 3/21/12 0910			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

03/24/2012

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # 38129

03/22/2012

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1165	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-01	3/19/2012	2300	water	Grab	1	X																	1
PRR1WATCME-02	3/20/2012	1640	water	Grab	1	X																	2
PRR1WATGACI-01	3/20/2012	1650	water	Grab	1		X																3
PRR1WATGACE-01	3/20/2012	1700	water	Grab	1		X																4

Requested Analyses	
1	TSS
2	COD
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/20/12	1745	[signature]	[signature]		
[signature]	03/20/12	1900	[signature]	[signature]	3/21/2012	[signature]
						09:30

C-5± 41837

1.3 ~~1.5~~

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1165 (200-9935)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17089R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1165 (200-9935) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-01	200-9935-1	Water	3/20/2012		X				X[1]
PRR1WATGACE-01	200-9935-2	Water	3/20/2012		X				X[1]
TB3202012	200-9935-3	Water	3/20/2012		X				
PRR1WATCME-01	460-38129-1	Water	3/19/2012						X[2]
PRR1WATCME-02	460-38129-2	Water	3/20/2012						X[2]

1. Miscellaneous parameters include Chemical Oxygen Demand (COD) by EPA Method 410.4
2. Miscellaneous parameters include Total Suspended Solids (TSS).
3. Volatiles by USEPA SOM0.1.2.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Compounds 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. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-01	Chlorobenzene	50 E	54 D	54 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

COD and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during COD and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

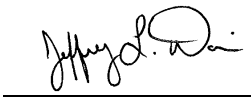
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 27, 2012

PEER REVIEW: Dennis Capria

DATE: September 26, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1165 - VOCs

ANALYTE	Units	PRR1WATGACE-01	LQ	VQ	PRR1WATGACI-01	LQ	VQ
2-Butanone	ug/L	5	U	U	4.5	J	J
Chlorobenzene	ug/L	0.5	U	U	54	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1165 - Miscellaneous

ANALYTE	Units	PRR1WATCME-01	LQ	VQ	PRR1WATCME-02	LQ	VQ	PRR1WATGACE-01	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			706		
Total Suspended Solids	mg/L	14			4			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1165 - Miscellaneous

ANALYTE	Units	PRR1WATGACI-01	LQ	VQ
Chemical Oxygen Demand	mg/L	415		
Total Suspended Solids	mg/L	NA		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	4.5	J
108-90-7	Chlorobenzene	54 ~~50~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-01DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 4.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	20	U
108-90-7	Chlorobenzene	54	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB3202012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1165

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9935-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDDH07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/21/2012

% Moisture: not dec. Date Analyzed: 03/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-01
Lab Sample ID: 460-38129-1
Lab Name: TestAmerica Edison
Job No.: 460-38129-1
SDG ID.:
Matrix: Water
Date Sampled: 03/19/2012 23:00
Reporting Basis: WET
Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	14.0	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-02 Lab Sample ID: 460-38129-2

Lab Name: TestAmerica Edison Job No.: 460-38129-1

SDG ID.:

Matrix: Water Date Sampled: 03/20/2012 16:40

Reporting Basis: WET Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	4.0	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-01 Lab Sample ID: 460-38129-3

Lab Name: TestAmerica Edison Job No.: 460-38129-1

SDG ID.:

Matrix: Water Date Sampled: 03/20/2012 16:50

Reporting Basis: WET Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	Chemical Oxygen Demand	415	10.0	5.9	mg/L			1	SM 5220D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-01 Lab Sample ID: 460-38129-4

Lab Name: TestAmerica Edison Job No.: 460-38129-1

SDG ID.:

Matrix: Water Date Sampled: 03/20/2012 17:00

Reporting Basis: WET Date Received: 03/21/2012 07:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	Chemical Oxygen Demand	706	10.0	5.9	mg/L			1	SM 5220D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1165	

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-01	3/20/2012	1655	water	Grab	3	X																	
PRR1WATGACE-01	3/20/2012	1705	water	Grab	3	X																	
TB03202012	3/20/2012	1710	water	—	3	X																	

Page 8 of 111

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 4.0

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/20/12	1745	MAS			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	03/20/12	1900	[signature] 3/21/12 0910			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

03/24/2012

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # 38129

03/22/2012

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1165	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-01	3/19/2012	2300	water	Grab	1	X																	1
PRR1WATCME-02	3/20/2012	1640	water	Grab	1	X																	2
PRR1WATGACI-01	3/20/2012	1650	water	Grab	1		X																3
PRR1WATGACE-01	3/20/2012	1700	water	Grab	1		X																4

Requested Analyses	
1	TSS
2	COD
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/20/12	1745	[signature]	[signature]		
[signature]	03/20/12	1900	[signature]	[signature]	3/21/2012	[signature]
						09:30

C-5± 41837

1.3 ~~1.5~~

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1168 (200-9960)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17092R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1168 (200-9960) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-03	200-9960-1	Water	3/21/2012		X	X	X	X	X
PRR1WATCMI-03	200-9964-1	Water	3/22/2012		X	X	X		
TB03212012	200-9960-2	Water	3/21/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate. This compound was detected in one sample at concentrations less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

One surrogate exhibited elevated recoveries associated with sample PRR1WATCMI-03. Therefore, positive results for the affected compounds indicate potential high bias.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited a concentration less than the PQL for butylbenzylphthalate. This compound was detected in sample PRR1WATCME-03 at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. The sample result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCMI-03	2,4-Dichlorophenol-d3	>UL

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	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The percent difference (%D) between columns exceeded 100% for 2,4-DDD which was detected above the reporting limit for sample location PRR1WATCMI-03. The 2,4-DDD result was flagged as estimated with possible interference.

Minor

The method blank exhibited low level concentrations of alpha-BHC, beta-BHC and delta-BHC. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

Two sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for alpha-BHC, beta-BHC and delta-BHC. These compounds were detected in the samples at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. The sample results for alpha-BHC, beta-BHC and delta-BHC associated with sample location PRR1WATCME-03 are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-03	2,4-DDE	54.8%
	2,4-DDT	71.1%
	2,4-DDD	42.6%
	Heptachlor	78.7%
	Aldrin	351.3%
	Heptachlor epoxide	248.0%
	Endosulfan I	167.6%
	Dieldrin	63.4%
	4,4'-DDE	28.7%
	4,4'-DDT	29.2%
	gamma-Chlordane	79.5%
PRR1WATCMI-03	2,4-DDE	73.5%
	2,4-DDT	474.9%
	2,4-DDD	999.9%
	delta-BHC	433.5%

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-03	2,4,5-T	21 E	480 D	480 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

Reported Sample Results	Qualification
Original sample result greater than the calibration range	EJ

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Lead. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

The serial dilution percent difference (%D) were greater than the acceptance limit for Nickel. Project accuracy measurement performance criteria were not met for the affected analytes.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Lead. This analyte was detected in sample PRR1WATCME-03 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. SERIAL DILUTION

Sample PRR1WATCME-03 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria with the following exceptions. The observed %D for arsenic did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1WATCME-03	Nickel	13%

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
> 10%	Non-detect	UJ
	Detect	J

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

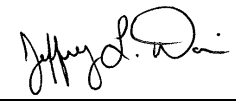
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.

Qualifier	Description
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: August 28, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - PCBs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ
Aroclor-1016	ug/L	0.94	U	U
Aroclor-1221	ug/L	0.94	U	U
Aroclor-1232	ug/L	0.94	U	U
Aroclor-1242	ug/L	0.94	U	U
Aroclor-1248	ug/L	0.94	U	U
Aroclor-1254	ug/L	0.94	U	U
Aroclor-1260	ug/L	0.94	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Pesticides

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,4'-DDD	ug/L	0.0034	J P	J	0.17	P	JN
2,4'-DDE	ug/L	0.0094	J P	U	0.095	J P	U
2,4'-DDT	ug/L	0.0094	J P	U	0.095	J P	U
4,4'-DDD	ug/L	0.0061	J	J	NA		
4,4'-DDE	ug/L	0.0013	J P	J	NA		
4,4'-DDT	ug/L	0.0016	J P	J	NA		
Aldrin	ug/L	0.0047	J P	U	NA		
Alpha-BHC	ug/L	0.0047	J P B	UB	NA		
Alpha-Chlordane	ug/L	0.0047	U	U	NA		
Beta-BHC	ug/L	0.0047	J P B	UB	NA		
Delta-BHC	ug/L	0.0047	J P B	UB	0.048	J P	U
Dieldrin	ug/L	0.0094	J P	U	NA		
Endosulfan I	ug/L	0.0047	J P	U	NA		
Endosulfan II	ug/L	0.0094	U	U	NA		
Endosulfan Sulfate	ug/L	0.0094	U	U	NA		
Endrin	ug/L	0.0094	U	U	NA		
Endrin Aldehyde	ug/L	0.0094	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0047	U	U	NA		
Gamma-Chlordane	ug/L	0.0047	J P	U	NA		
Heptachlor	ug/L	0.0047	J P	U	NA		
Heptachlor Epoxide	ug/L	0.0047	J P	U	NA		
Toxaphene	ug/L	0.47	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Herbicides

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,4,5-T	ug/L	0.45	U	U	480	D	D
2,4-D	ug/L	1.8	U	U	NA		
2,4-DB	ug/L	1.6	U	U	NA		
Dinoseb	ug/L	0.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - VOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	0.65	J	J
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	1	U	U	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	10	U	U	8.4	J	J
Acrolein	ug/L	10	U	U	NA		
Acrylonitrile	ug/L	10	U	U	NA		
Benzene	ug/L	1	U	U	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	U	U	NA		
Chlorobenzene	ug/L	1	U	U	NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	1	U	U	NA		
Chloromethane	ug/L	1	U	U	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	1	U	U	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	1	U	U	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - VOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - SVOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.7	U	U	NA		
2,4,5-Trichlorophenol	ug/L	4.7	U	U	180		J
2,4,6-Trichlorophenol	ug/L	4.7	U	U	NA		
2,4-Dichlorophenol	ug/L	4.7	U	U	NA		
2,4-Dimethylphenol	ug/L	4.7	U	U	NA		
2,4-Dinitrophenol	ug/L	9.5	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.7	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.7	U	U	NA		
2-Chlorophenol	ug/L	4.7	U	U	NA		
2-Nitrophenol	ug/L	4.7	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.7	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.5	U	U	140	U	U
4-Nitrophenol	ug/L	9.5	U	U	NA		
Anthracene	ug/L	4.7	U	U	NA		
Benzidine	ug/L	9.5	U	U	NA		
Benzo(a)anthracene	ug/L	4.7	U	U	NA		
Benzo(a)pyrene	ug/L	4.7	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.7	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.7	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.7	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	0.98	J	J	NA		
Butylbenzylphthalate	ug/L	4.7	J B	UB	NA		
Chrysene	ug/L	4.7	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.7	U	U	NA		
Diethylphthalate	ug/L	4.7	U	U	NA		
Dimethylphthalate	ug/L	4.7	U	U	NA		
Di-n-Butylphthalate	ug/L	4.7	U	U	NA		
Fluoranthene	ug/L	4.7	U	U	NA		
Fluorene	ug/L	4.7	U	U	NA		
Hexachlorobenzene	ug/L	4.7	U	U	NA		
Hexachlorobutadiene	ug/L	4.7	U	U	NA		
Hexachlorocyclopentadiene	ug/L	4.7	U	U	NA		
Hexachloroethane	ug/L	4.7	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - SVOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.7	U	U	NA		
Indeno(1,2,3-cd)pyrene	ug/L	4.7	U	U	NA		
Isophorone	ug/L	4.7	U	U	NA		
Naphthalene	ug/L	4.7	U	U	NA		
Nitrobenzene	ug/L	4.7	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.5	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.7	U	U	NA		
Pentachlorophenol	ug/L	9.5	U	U	NA		
Phenanthrene	ug/L	4.7	U	U	NA		
Phenol	ug/L	4.7	U	U	NA		
Pyrene	ug/L	4.7	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Inorganics

ANALYTE	Units	PRR1WATCME-03	LQ	VQ
Antimony	ug/L	6.1		
Arsenic	ug/L	7.2		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2	J	J
Copper	ug/L	4.8		
Cyanide	ug/L	10	U	U
Lead	ug/L	1	J	UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	23.2	E	J
Selenium	ug/L	12.2		
Silver	ug/L	0.033	J	J
Zinc	ug/L	1.4	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Miscellaneous

ANALYTE	Units	PRR1WATCME-03
Chemical Oxygen Demand	mg/L	NA
Total Organic Carbon	mg/L	4
Total Suspended Solids	mg/L	10.8

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: RJTNL06.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/22/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/23/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/27/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.5	U
108-95-2	Phenol	4.7	U
111-44-4	Bis(2-chloroethyl)ether	4.7	U
95-57-8	2-Chlorophenol	4.7	U
108-60-1	2,2'-Oxybis(1-chloropropane)	4.7	U
67-72-1	Hexachloroethane	4.7	U
98-95-3	Nitrobenzene	4.7	U
78-59-1	Isophorone	4.7	U
88-75-5	2-Nitrophenol	4.7	U
105-67-9	2,4-Dimethylphenol	4.7	U
120-83-2	2,4-Dichlorophenol	4.7	U
91-20-3	Naphthalene	4.7	U
87-68-3	Hexachlorobutadiene	4.7	U
77-47-4	Hexachlorocyclopentadiene	4.7	U
88-06-2	2,4,6-Trichlorophenol	4.7	U
95-95-4	2,4,5-Trichlorophenol	4.7	U
131-11-3	Dimethylphthalate	4.7	U
606-20-2	2,6-Dinitrotoluene	4.7	U
51-28-5	2,4-Dinitrophenol	9.5	U
100-02-7	4-Nitrophenol	9.5	U
121-14-2	2,4-Dinitrotoluene	4.7	U
84-66-2	Diethylphthalate	4.7	U
86-73-7	Fluorene	4.7	U
534-52-1	4,6-Dinitro-2-methylphenol	9.5	U
86-30-6	N-Nitrosodiphenylamin[1]	4.7	U
118-74-1	Hexachlorobenzene	4.7	U
87-86-5	Pentachlorophenol	9.5	U
85-01-8	Phenanthrene	4.7	U
120-12-7	Anthracene	4.7	U
84-74-2	Di-n-butylphthalate	4.7	U
206-44-0	Fluoranthene	4.7	U
92-87-5	Benzidine	9.5	U
129-00-0	Pyrene	4.7	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1
Sample wt/vol: 1060 (g/mL) mL Lab File ID: RJTNL06.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/23/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/27/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.7 ~~0.23~~	~~J B~~ uB
91-94-1	3,3'-Dichlorobenzidine	4.7	U
56-55-3	Benzo(a)anthracene	4.7	U
218-01-9	Chrysene	4.7	U
117-81-7	Bis(2-ethylhexyl)phthalate	0.98	J
205-99-2	Benzo(b)fluoranthene	4.7	U
207-08-9	Benzo(k)fluoranthene	4.7	U
50-32-8	Benzo(a)pyrene	4.7	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	U
53-70-3	Dibenzo(a,h)anthracene	4.7	U

[1]Cannot be separated from Diphenylamine

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1
Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJTNL10.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/23/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/27/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 14.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	180	J
534-52-1	4,6-Dinitro-2-methylphenol	140	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	1.0	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	8.4	J
87-61-6	1,2,3-Trichlorobenzene	0.65	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03212012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	5.0	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	5.0	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03212012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-2
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012
% Moisture: not dec. Date Analyzed: 03/23/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1
Sample wt/vol: 1060 (g/mL) mL Lab File ID: 23MA122213-R031.D
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Extraction: (Type) SEPF Date Extracted: 03/23/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/24/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
3424-82-6	2,4'-DDE	0.0094 0.0010	~~J P~~ U
789-02-6	2,4'-DDT	0.0094 ~~0.00071~~	~~J P~~ U
53-19-0	2,4'-DDD	0.0034	J ~~P~~

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1
Sample wt/vol: 1060 (g/mL) mL Lab File ID: 26MA122151-R051.D
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Extraction: (Type) SEPF Date Extracted: 03/26/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/26/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.0047	~~0.000061~~	~~J P B~~ UB
319-85-7	beta-BHC	0.0047	~~0.0017~~	~~J P B~~ UB
319-86-8	delta-BHC	0.0047	~~0.00012~~	~~J P B~~ UB
58-89-9	gamma-BHC (Lindane)		0.0047	U
76-44-8	Heptachlor	0.0047	~~0.00049~~	~~J P~~ U
309-00-2	Aldrin	0.0047	~~0.00015~~	~~J P~~ U
1024-57-3	Heptachlor epoxide	0.0047	~~0.00017~~	~~J P~~ U
959-98-8	Endosulfan I	0.0047	0.00017	~~J P~~ U
60-57-1	Dieldrin	0.0094	0.00014	~~J P~~ U
72-55-9	4,4'-DDE		0.0013	J ~~P~~
72-20-8	Endrin		0.0094	U
33213-65-9	Endosulfan II		0.0094	U
72-54-8	4,4'-DDD		0.0061	J
1031-07-8	Endosulfan sulfate		0.0094	U
50-29-3	4,4'-DDT		0.0016	J ~~P~~
7421-93-4	Endrin aldehyde		0.0094	U
5103-71-9	alpha-Chlordane		0.0047	U
5103-74-2	gamma-Chlordane	0.0047	~~0.00026~~	~~J P~~ U
8001-35-2	Toxaphene		0.47	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23MA122213-R061.D

% Moisture: Decanted: (Y/N) Date Received: 03/22/2012

Extraction: (Type) SEPF Date Extracted: 03/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.095 ~~0.025~~	~~J P~~ U
53-19-0	2,4'-DDD	0.17	~~P~~ JN
789-02-6	2,4'-DDT	0.095 ~~0.022~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23MA122153-R081.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 03/22/2012

Extraction: (Type) SEPF Date Extracted: 03/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.048 ~~0.0052~~	J P U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 26MA120845-R061.D

% Moisture: Decanted: (Y/N) Date Received: 03/22/2012

Extraction: (Type) SEPF Date Extracted: 03/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/26/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.94	U
11104-28-2	Aroclor-1221	0.94	U
11141-16-5	Aroclor-1232	0.94	U
53469-21-9	Aroclor-1242	0.94	U
12672-29-6	Aroclor-1248	0.94	U
11097-69-1	Aroclor-1254	0.94	U
11096-82-5	Aroclor-1260	0.94	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9960-2

SDG No.: PRR1168

Client Sample ID: PRR1WATCME-03 Lab Sample ID: 200-9960-1

Matrix: Water Lab File ID: 23ma121709-r051.d

Analysis Method: 8151A Date Collected: 03/21/2012 10:30

Extraction Method: 8151A Date Extracted: 03/23/2012 10:21

Sample wt/vol: 1055(mL) Date Analyzed: 03/23/2012 19:47

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35618 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.8	U	1.8	0.62
94-82-6	2,4-DB	1.6	U	1.6	0.45
88-85-7	Dinoseb	0.90	U	0.90	0.18
93-76-5	2,4,5-T	0.45	U	0.45	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	90		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-9960-2

SDG No.: PRR1168

Client Sample ID: PRR1WATCMI-03 | Lab Sample ID: 200-9964-1

Matrix: Water | Lab File ID: 23ma121709-r061.d

Analysis Method: 8151A | Date Collected: 03/22/2012 10:40

Extraction Method: 8151A | Date Extracted: 03/23/2012 10:21

Sample wt/vol: 1050(mL) | Date Analyzed: 03/23/2012 20:22

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 35618 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	21	E ~~P~~ J	0.45	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	118		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9960-2

SDG No.: PRR1168

Client Sample ID: PRR1WATCMI-03 DL Lab Sample ID: 200-9964-1 DL

Matrix: Water Lab File ID: 25ma121214-r031.d

Analysis Method: 8151A Date Collected: 03/22/2012 10:40

Extraction Method: 8151A Date Extracted: 03/23/2012 10:21

Sample wt/vol: 1050(mL) Date Analyzed: 03/25/2012 13:45

Con. Extract Vol.: 10000(uL) Dilution Factor: 100

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35619 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	*2,4,5-T*	*480*	*D*	*45*	*12*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	*D X*	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1168
Matrix: WATER Lab Sample Id: 200-9960-1
% Solids: Date Received: 03/22/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	6.1			MS
7440-38-2	Arsenic	7.2			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.0	J		MS
7440-50-8	Copper	4.8			MS
7439-92-1	Lead	1.0 ~~0.89~~	~~J~~	UB ~~E~~ J	MS
7440-02-0	Nickel	23.2			MS
7782-49-2	Selenium	12.2			MS
7440-22-4	Silver	0.033	J		MS
7440-66-6	Zinc	1.4	J		MS

Color Before: COLORLESS Clarity Before: CLEAR Texture: NA
Color After: COLORLESS Clarity After: CLEAR Artifacts: NA
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1168
Matrix: WATER Lab Sample Id: 200-9960-1
% Solids: Date Received: 03/22/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1168
Matrix: WATER Lab Sample Id: 200-9960-1
% Solids: Date Received: 03/22/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-03 Lab Sample ID: 200-9960-1

Lab Name: TestAmerica Burlington Job No.: 200-9960-2

SDG ID.: PRR1168

Matrix: Water Date Sampled: 03/21/2012 10:30

Reporting Basis: WET Date Received: 03/22/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	4.0	1.0	0.14	mg/L			1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-03 Lab Sample ID: 460-38173-1

Lab Name: TestAmerica Edison Job No.: 460-38173-1

SDG ID.:

Matrix: Water Date Sampled: 03/21/2012 10:30

Reporting Basis: WET Date Received: 03/21/2012 16:11

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.8	4.0		mg/L			1	SM 2540D

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1168	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-03	3/21/2012	10:30	water	Grab	14	X	X	X	X	X	X	X	X										
PRR1WATCMI-03	3/21/2012	10:40	water	Grab	9		X	X		X			X										
TB03212012	3/21/2012		water	---	2	X																	

Page 1 of 1

	Requested Analyses
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals+Hg
7	Cyanide
8	Herbicides
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to QAPP WS 15-4 for Effluent Sample Analyses and WS15-5 for Influent Sample Analyses
X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	03/21/12	1400	[signature] TA-BUR 3/22/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

04/07/2012

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # 38173

03/22/2012

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1168	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-03	3/21/2012	10:30	water	Grab	1	X																	

Requested Analyses	
1	TSS
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ

Shipping Tracking #

Specify Turnaround Requirements: TAT 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	3/21/2012	1400			3/21/12 1611	3/21/12 1611
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

1.6 Thermo

Page 25 of 26

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1168 (200-9960)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17092R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1168 (200-9960) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-03	200-9960-1	Water	3/21/2012		X	X	X	X	X
PRR1WATCMI-03	200-9964-1	Water	3/22/2012		X	X	X		
TB03212012	200-9960-2	Water	3/21/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate. This compound was detected in one sample at concentrations less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

One surrogate exhibited elevated recoveries associated with sample PRR1WATCMI-03. Therefore, positive results for the affected compounds indicate potential high bias.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited a concentration less than the PQL for butylbenzylphthalate. This compound was detected in sample PRR1WATCME-03 at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. The sample result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCMI-03	2,4-Dichlorophenol-d3	>UL

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	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The percent difference (%D) between columns exceeded 100% for 2,4-DDD which was detected above the reporting limit for sample location PRR1WATCMI-03. The 2,4-DDD result was flagged as estimated with possible interference.

Minor

The method blank exhibited low level concentrations of alpha-BHC, beta-BHC and delta-BHC. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

Two sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for alpha-BHC, beta-BHC and delta-BHC. These compounds were detected in the samples at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. The sample results for alpha-BHC, beta-BHC and delta-BHC associated with sample location PRR1WATCME-03 are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-03	2,4-DDE	54.8%
	2,4-DDT	71.1%
	2,4-DDD	42.6%
	Heptachlor	78.7%
	Aldrin	351.3%
	Heptachlor epoxide	248.0%
	Endosulfan I	167.6%
	Dieldrin	63.4%
	4,4'-DDE	28.7%
	4,4'-DDT	29.2%
	gamma-Chlordane	79.5%
PRR1WATCMI-03	2,4-DDE	73.5%
	2,4-DDT	474.9%
	2,4-DDD	999.9%
	delta-BHC	433.5%

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-03	2,4,5-T	21 E	480 D	480 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

Reported Sample Results	Qualification
Original sample result greater than the calibration range	EJ

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Lead. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

The serial dilution percent difference (%D) were greater than the acceptance limit for Nickel. Project accuracy measurement performance criteria were not met for the affected analytes.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Lead. This analyte was detected in sample PRR1WATCME-03 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. SERIAL DILUTION

Sample PRR1WATCME-03 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria with the following exceptions. The observed %D for arsenic did not meet acceptance criteria indicating possible matrix interference. Project accuracy/bias measurement performance criteria were not met for these analytes. Serial dilution %D and validation qualification are described in the following tables.

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)
PRR1WATCME-03	Nickel	13%

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
> 10%	Non-detect	UJ
	Detect	J

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

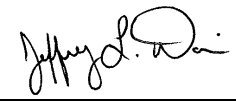
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.

Qualifier	Description
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: August 28, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - PCBs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ
Aroclor-1016	ug/L	0.94	U	U
Aroclor-1221	ug/L	0.94	U	U
Aroclor-1232	ug/L	0.94	U	U
Aroclor-1242	ug/L	0.94	U	U
Aroclor-1248	ug/L	0.94	U	U
Aroclor-1254	ug/L	0.94	U	U
Aroclor-1260	ug/L	0.94	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Pesticides

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,4'-DDD	ug/L	0.0034	J P	J	0.17	P	JN
2,4'-DDE	ug/L	0.0094	J P	U	0.095	J P	U
2,4'-DDT	ug/L	0.0094	J P	U	0.095	J P	U
4,4'-DDD	ug/L	0.0061	J	J	NA		
4,4'-DDE	ug/L	0.0013	J P	J	NA		
4,4'-DDT	ug/L	0.0016	J P	J	NA		
Aldrin	ug/L	0.0047	J P	U	NA		
Alpha-BHC	ug/L	0.0047	J P B	UB	NA		
Alpha-Chlordane	ug/L	0.0047	U	U	NA		
Beta-BHC	ug/L	0.0047	J P B	UB	NA		
Delta-BHC	ug/L	0.0047	J P B	UB	0.048	J P	U
Dieldrin	ug/L	0.0094	J P	U	NA		
Endosulfan I	ug/L	0.0047	J P	U	NA		
Endosulfan II	ug/L	0.0094	U	U	NA		
Endosulfan Sulfate	ug/L	0.0094	U	U	NA		
Endrin	ug/L	0.0094	U	U	NA		
Endrin Aldehyde	ug/L	0.0094	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0047	U	U	NA		
Gamma-Chlordane	ug/L	0.0047	J P	U	NA		
Heptachlor	ug/L	0.0047	J P	U	NA		
Heptachlor Epoxide	ug/L	0.0047	J P	U	NA		
Toxaphene	ug/L	0.47	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Herbicides

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,4,5-T	ug/L	0.45	U	U	480	D	D
2,4-D	ug/L	1.8	U	U	NA		
2,4-DB	ug/L	1.6	U	U	NA		
Dinoseb	ug/L	0.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - VOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	0.65	J	J
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	1	U	U	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	10	U	U	8.4	J	J
Acrolein	ug/L	10	U	U	NA		
Acrylonitrile	ug/L	10	U	U	NA		
Benzene	ug/L	1	U	U	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	U	U	NA		
Chlorobenzene	ug/L	1	U	U	NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	1	U	U	NA		
Chloromethane	ug/L	1	U	U	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	1	U	U	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	1	U	U	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - VOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - SVOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.7	U	U	NA		
2,4,5-Trichlorophenol	ug/L	4.7	U	U	180		J
2,4,6-Trichlorophenol	ug/L	4.7	U	U	NA		
2,4-Dichlorophenol	ug/L	4.7	U	U	NA		
2,4-Dimethylphenol	ug/L	4.7	U	U	NA		
2,4-Dinitrophenol	ug/L	9.5	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.7	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.7	U	U	NA		
2-Chlorophenol	ug/L	4.7	U	U	NA		
2-Nitrophenol	ug/L	4.7	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.7	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.5	U	U	140	U	U
4-Nitrophenol	ug/L	9.5	U	U	NA		
Anthracene	ug/L	4.7	U	U	NA		
Benzidine	ug/L	9.5	U	U	NA		
Benzo(a)anthracene	ug/L	4.7	U	U	NA		
Benzo(a)pyrene	ug/L	4.7	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.7	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.7	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.7	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	0.98	J	J	NA		
Butylbenzylphthalate	ug/L	4.7	J B	UB	NA		
Chrysene	ug/L	4.7	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.7	U	U	NA		
Diethylphthalate	ug/L	4.7	U	U	NA		
Dimethylphthalate	ug/L	4.7	U	U	NA		
Di-n-Butylphthalate	ug/L	4.7	U	U	NA		
Fluoranthene	ug/L	4.7	U	U	NA		
Fluorene	ug/L	4.7	U	U	NA		
Hexachlorobenzene	ug/L	4.7	U	U	NA		
Hexachlorobutadiene	ug/L	4.7	U	U	NA		
Hexachlorocyclopentadiene	ug/L	4.7	U	U	NA		
Hexachloroethane	ug/L	4.7	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - SVOCs

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.7	U	U	NA		
Indeno(1,2,3-cd)pyrene	ug/L	4.7	U	U	NA		
Isophorone	ug/L	4.7	U	U	NA		
Naphthalene	ug/L	4.7	U	U	NA		
Nitrobenzene	ug/L	4.7	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.5	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.7	U	U	NA		
Pentachlorophenol	ug/L	9.5	U	U	NA		
Phenanthrene	ug/L	4.7	U	U	NA		
Phenol	ug/L	4.7	U	U	NA		
Pyrene	ug/L	4.7	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Inorganics

ANALYTE	Units	PRR1WATCME-03	LQ	VQ
Antimony	ug/L	6.1		
Arsenic	ug/L	7.2		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2	J	J
Copper	ug/L	4.8		
Cyanide	ug/L	10	U	U
Lead	ug/L	1	J	UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	23.2	E	J
Selenium	ug/L	12.2		
Silver	ug/L	0.033	J	J
Zinc	ug/L	1.4	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1168 - Miscellaneous

ANALYTE	Units	PRR1WATCME-03
Chemical Oxygen Demand	mg/L	NA
Total Organic Carbon	mg/L	4
Total Suspended Solids	mg/L	10.8

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: RJTNL06.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/22/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/23/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/27/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.5	U
108-95-2	Phenol	4.7	U
111-44-4	Bis(2-chloroethyl)ether	4.7	U
95-57-8	2-Chlorophenol	4.7	U
108-60-1	2,2'-Oxybis(1-chloropropane)	4.7	U
67-72-1	Hexachloroethane	4.7	U
98-95-3	Nitrobenzene	4.7	U
78-59-1	Isophorone	4.7	U
88-75-5	2-Nitrophenol	4.7	U
105-67-9	2,4-Dimethylphenol	4.7	U
120-83-2	2,4-Dichlorophenol	4.7	U
91-20-3	Naphthalene	4.7	U
87-68-3	Hexachlorobutadiene	4.7	U
77-47-4	Hexachlorocyclopentadiene	4.7	U
88-06-2	2,4,6-Trichlorophenol	4.7	U
95-95-4	2,4,5-Trichlorophenol	4.7	U
131-11-3	Dimethylphthalate	4.7	U
606-20-2	2,6-Dinitrotoluene	4.7	U
51-28-5	2,4-Dinitrophenol	9.5	U
100-02-7	4-Nitrophenol	9.5	U
121-14-2	2,4-Dinitrotoluene	4.7	U
84-66-2	Diethylphthalate	4.7	U
86-73-7	Fluorene	4.7	U
534-52-1	4,6-Dinitro-2-methylphenol	9.5	U
86-30-6	N-Nitrosodiphenylamin[1]	4.7	U
118-74-1	Hexachlorobenzene	4.7	U
87-86-5	Pentachlorophenol	9.5	U
85-01-8	Phenanthrene	4.7	U
120-12-7	Anthracene	4.7	U
84-74-2	Di-n-butylphthalate	4.7	U
206-44-0	Fluoranthene	4.7	U
92-87-5	Benzidine	9.5	U
129-00-0	Pyrene	4.7	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1
Sample wt/vol: 1060 (g/mL) mL Lab File ID: RJTNL06.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/23/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/27/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.7 ~~0.23~~	~~J B~~ uB
91-94-1	3,3'-Dichlorobenzidine	4.7	U
56-55-3	Benzo(a)anthracene	4.7	U
218-01-9	Chrysene	4.7	U
117-81-7	Bis(2-ethylhexyl)phthalate	0.98	J
205-99-2	Benzo(b)fluoranthene	4.7	U
207-08-9	Benzo(k)fluoranthene	4.7	U
50-32-8	Benzo(a)pyrene	4.7	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	U
53-70-3	Dibenzo(a,h)anthracene	4.7	U

[1]Cannot be separated from Diphenylamine

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1
Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJTNL10.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/23/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 03/27/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 14.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	180	J
534-52-1	4,6-Dinitro-2-methylphenol	140	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	1.0	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	8.4	J
87-61-6	1,2,3-Trichlorobenzene	0.65	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03212012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	5.0	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	5.0	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03212012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-2
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 03/22/2012
% Moisture: not dec. Date Analyzed: 03/23/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1
Sample wt/vol: 1060 (g/mL) mL Lab File ID: 23MA122213-R031.D
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Extraction: (Type) SEPF Date Extracted: 03/23/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/24/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
3424-82-6	2,4'-DDE	0.0094 0.0010	~~J P~~ U
789-02-6	2,4'-DDT	0.0094 ~~0.00071~~	~~J P~~ U
53-19-0	2,4'-DDD	0.0034	J ~~P~~

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1
Sample wt/vol: 1060 (g/mL) mL Lab File ID: 26MA122151-R051.D
% Moisture: Decanted: (Y/N) Date Received: 03/22/2012
Extraction: (Type) SEPF Date Extracted: 03/26/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/26/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.0047	~~0.000061~~	~~J P B~~ UB
319-85-7	beta-BHC	0.0047	~~0.0017~~	~~J P B~~ UB
319-86-8	delta-BHC	0.0047	~~0.00012~~	~~J P B~~ UB
58-89-9	gamma-BHC (Lindane)		0.0047	U
76-44-8	Heptachlor	0.0047	~~0.00049~~	~~J P~~ U
309-00-2	Aldrin	0.0047	~~0.00015~~	~~J P~~ U
1024-57-3	Heptachlor epoxide	0.0047	~~0.00017~~	~~J P~~ U
959-98-8	Endosulfan I	0.0047	0.00017	~~J P~~ U
60-57-1	Dieldrin	0.0094	0.00014	~~J P~~ U
72-55-9	4,4'-DDE		0.0013	J ~~P~~
72-20-8	Endrin		0.0094	U
33213-65-9	Endosulfan II		0.0094	U
72-54-8	4,4'-DDD		0.0061	J
1031-07-8	Endosulfan sulfate		0.0094	U
50-29-3	4,4'-DDT		0.0016	J ~~P~~
7421-93-4	Endrin aldehyde		0.0094	U
5103-71-9	alpha-Chlordane		0.0047	U
5103-74-2	gamma-Chlordane	0.0047	~~0.00026~~	~~J P~~ U
8001-35-2	Toxaphene		0.47	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23MA122213-R061.D

% Moisture: Decanted: (Y/N) Date Received: 03/22/2012

Extraction: (Type) SEPF Date Extracted: 03/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.095 ~~0.025~~	~~J P~~ U
53-19-0	2,4'-DDD	0.17	~~P~~ JN
789-02-6	2,4'-DDT	0.095 ~~0.022~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9964-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23MA122153-R081.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 03/22/2012

Extraction: (Type) SEPF Date Extracted: 03/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.048 ~~0.0052~~	J P U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1168

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9960-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 26MA120845-R061.D

% Moisture: Decanted: (Y/N) Date Received: 03/22/2012

Extraction: (Type) SEPF Date Extracted: 03/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/26/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.94	U
11104-28-2	Aroclor-1221	0.94	U
11141-16-5	Aroclor-1232	0.94	U
53469-21-9	Aroclor-1242	0.94	U
12672-29-6	Aroclor-1248	0.94	U
11097-69-1	Aroclor-1254	0.94	U
11096-82-5	Aroclor-1260	0.94	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9960-2

SDG No.: PRR1168

Client Sample ID: PRR1WATCME-03 Lab Sample ID: 200-9960-1

Matrix: Water Lab File ID: 23ma121709-r051.d

Analysis Method: 8151A Date Collected: 03/21/2012 10:30

Extraction Method: 8151A Date Extracted: 03/23/2012 10:21

Sample wt/vol: 1055(mL) Date Analyzed: 03/23/2012 19:47

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35618 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.8	U	1.8	0.62
94-82-6	2,4-DB	1.6	U	1.6	0.45
88-85-7	Dinoseb	0.90	U	0.90	0.18
93-76-5	2,4,5-T	0.45	U	0.45	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	90		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-9960-2

SDG No.: PRR1168

Client Sample ID: PRR1WATCMI-03 | Lab Sample ID: 200-9964-1

Matrix: Water | Lab File ID: 23ma121709-r061.d

Analysis Method: 8151A | Date Collected: 03/22/2012 10:40

Extraction Method: 8151A | Date Extracted: 03/23/2012 10:21

Sample wt/vol: 1050(mL) | Date Analyzed: 03/23/2012 20:22

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 35618 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	21	E ~~P~~ J	0.45	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	118		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-9960-2

SDG No.: PRR1168

Client Sample ID: PRR1WATCMI-03 DL Lab Sample ID: 200-9964-1 DL

Matrix: Water Lab File ID: 25ma121214-r031.d

Analysis Method: 8151A Date Collected: 03/22/2012 10:40

Extraction Method: 8151A Date Extracted: 03/23/2012 10:21

Sample wt/vol: 1050(mL) Date Analyzed: 03/25/2012 13:45

Con. Extract Vol.: 10000(uL) Dilution Factor: 100

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 35619 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	*2,4,5-T*	*480*	*D*	*45*	*12*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	*D X*	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1168
Matrix: WATER Lab Sample Id: 200-9960-1
% Solids: Date Received: 03/22/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	6.1			MS
7440-38-2	Arsenic	7.2			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.0	J		MS
7440-50-8	Copper	4.8			MS
7439-92-1	Lead	1.0 ~~0.89~~	~~J~~	UB ~~E~~ J	MS
7440-02-0	Nickel	23.2			MS
7782-49-2	Selenium	12.2			MS
7440-22-4	Silver	0.033	J		MS
7440-66-6	Zinc	1.4	J		MS

Color Before: COLORLESS Clarity Before: CLEAR Texture: NA
Color After: COLORLESS Clarity After: CLEAR Artifacts: NA
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1168
Matrix: WATER Lab Sample Id: 200-9960-1
% Solids: Date Received: 03/22/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1168
Matrix: WATER Lab Sample Id: 200-9960-1
% Solids: Date Received: 03/22/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-03 Lab Sample ID: 200-9960-1

Lab Name: TestAmerica Burlington Job No.: 200-9960-2

SDG ID.: PRR1168

Matrix: Water Date Sampled: 03/21/2012 10:30

Reporting Basis: WET Date Received: 03/22/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	4.0	1.0	0.14	mg/L			1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-03 Lab Sample ID: 460-38173-1

Lab Name: TestAmerica Edison Job No.: 460-38173-1

SDG ID.:

Matrix: Water Date Sampled: 03/21/2012 10:30

Reporting Basis: WET Date Received: 03/21/2012 16:11

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.8	4.0		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1168	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-03	3/21/2012	10:30	water	Grab	14	X	X	X	X	X	X	X	X										
PRR1WATCMI-03	3/21/2012	10:40	water	Grab	9		X	X		X			X										
TB03212012	3/21/2012		water	---	2	X																	

Page 1 of 1

	Requested Analyses
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals+Hg
7	Cyanide
8	Herbicides
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to QAPP WS 15-4 for Effluent Sample Analyses and WS15-5 for Influent Sample Analyses
X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	03/21/12	1400	[signature] TA-BUR 3/22/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

04/07/2012

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # 38173

03/22/2012

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1168	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-03	3/21/2012	10:30	water	Grab	1	X																	

Requested Analyses	
1	TSS
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ

Shipping Tracking #

Specify Turnaround Requirements: TAT 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	3/21/2012	1400			3/21/12 1611	3/21/12 1611
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

1.6 Thermo

Page 25 of 26

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1171 (200-9981 and 200-10004)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17111R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1171 (200-9981 and 200-10004) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-02	200-10004-1	Water	3/22/2012						X[1]
PRR1WATGACE-02	200-10004-2	Water	3/22/2012						X[1]
PRR1WATGACI-02	200-9981-1	Water	3/22/2012		X				
PRR1WATGACE-02	200-9981-2	Water	3/22/2012		X				
TB03222012	200-9981-3	Water	3/22/2012		X				
PRR1WATCME-04	460-38208-3	Water	3/22/2012						X[2]
PRR1WATSP101-01	460-38208-4	Water	3/22/2012						X[2]

1. Miscellaneous parameters include Chemical Oxygen Demand (COD) by EPA Method 410.4
2. Miscellaneous parameters include Total Suspended Solids (TSS).
3. Volatiles by USEPA SOM0.1.2.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during Volatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-02	Chlorobenzene	690 E	670 D	670 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

COD and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during COD and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

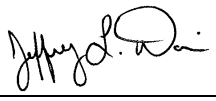
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 29, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1171 - VOCs

ANALYTE	Units	PRR1WATGACE-02	LQ	VQ	PRR1WATGACI-02	LQ	VQ
2-Butanone	ug/L	10	U	U	140		
Chlorobenzene	ug/L	1	U	U	670	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1171 - Miscellaneous

ANALYTE	Units	PRR1WATCME-04	LQ	VQ	PRR1WATGACE-02	LQ	VQ	PRR1WATGACI-02	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			238			179		
Total Suspended Solids	mg/L	15			NA			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1171 - Miscellaneous

ANALYTE	Units	PRR1WATSP101-01	LQ	VQ
Chemical Oxygen Demand	mg/L	NA		
Total Suspended Solids	mg/L	56		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. _____ Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. _____ Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	
108-90-7	Chlorobenzene	670 ~~690~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-02DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	J D
108-90-7	Chlorobenzene	670	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03222012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

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Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.: B0009964.0002.70004
PROJECT NAME: Tierra Phase I Removal
SAMPLERS:
SDG NUMBER: PRR1171
COC Number:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-02	3/22/2012	15:00	water	Grab	3	X																	
PRR1WATGACE-02	3/22/2012	15:10	water	Grab	3	X																	
TB03222012	3/22/2012	0:00	water	—	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/22/12	15 15	[signature]			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
			[signature] TALEE 3/23/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

Page 1 of 113

03/27/2012

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-02 Lab Sample ID: 200-10004-1

Lab Name: TestAmerica Burlington Job No.: 200-10004-1

SDG ID.: PRR1171

Matrix: Water Date Sampled: 03/22/2012 14:55

Reporting Basis: WET Date Received: 03/24/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	179	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-02 Lab Sample ID: 200-10004-2

Lab Name: TestAmerica Burlington Job No.: 200-10004-1

SDG ID.: PRR1171

Matrix: Water Date Sampled: 03/22/2012 14:55

Reporting Basis: WET Date Received: 03/24/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	238	80.0		mg/L			4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-04 Lab Sample ID: 460-38208-3

Lab Name: TestAmerica Edison Job No.: 460-38208-1

SDG ID.:

Matrix: Water Date Sampled: 03/22/2012 14:50

Reporting Basis: WET Date Received: 03/22/2012 16:07

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.0	10.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-01 Lab Sample ID: 460-38208-4

Lab Name: TestAmerica Edison Job No.: 460-38208-1

SDG ID.:

Matrix: Water Date Sampled: 03/22/2012 14:45

Reporting Basis: WET Date Received: 03/22/2012 16:07

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	56.0	10.0		mg/L			1	SM 2540D

T.A. Burlington

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

460-38208

PROJ. NO.: B0009964.0002.70004
PROJECT NAME: Tierra Phase I Removal
SAMPLERS:
SDG NUMBER: PRR1171
COC Number:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-02	3/22/2012	14:55	water	Grab	1		X																1 COD
PRR1WATGACE-02	3/22/2012	14:55	water	Grab	1		X																2 COD
PRR1WATCME-04	3/22/2012	14:50	water	Grab	1	X																	3 TSS
PRR1WATSP101-01	3/22/2012	14:45	water	Grab	1	X																	4 TSS

Requested Analyses

1 TSS
2 COD
3
4
7
5
6
7
8
9
10
11
12
13
14
15
16
17

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ
Shipping Tracking #
Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice
☐ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/22/12	1515	WAT	[signature] TestAmerica	3/23/12 1515	UPS
WAT	03/22/12	1530	[signature]			
[signature]	3/22/12	1607	[signature] 3/22/12			

Rec'd: [signature] TABER 3/24/12 0900

7 Day RUSH

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#50

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1171 (200-9981 and 200-10004)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17111R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1171 (200-9981 and 200-10004) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-02	200-10004-1	Water	3/22/2012						X[1]
PRR1WATGACE-02	200-10004-2	Water	3/22/2012						X[1]
PRR1WATGACI-02	200-9981-1	Water	3/22/2012		X				
PRR1WATGACE-02	200-9981-2	Water	3/22/2012		X				
TB03222012	200-9981-3	Water	3/22/2012		X				
PRR1WATCME-04	460-38208-3	Water	3/22/2012						X[2]
PRR1WATSP101-01	460-38208-4	Water	3/22/2012						X[2]

1. Miscellaneous parameters include Chemical Oxygen Demand (COD) by EPA Method 410.4
2. Miscellaneous parameters include Total Suspended Solids (TSS).
3. Volatiles by USEPA SOM0.1.2.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during Volatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-02	Chlorobenzene	690 E	670 D	670 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

COD and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during COD and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

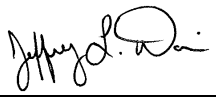
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 29, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1171 - VOCs

ANALYTE	Units	PRR1WATGACE-02	LQ	VQ	PRR1WATGACI-02	LQ	VQ
2-Butanone	ug/L	10	U	U	140		
Chlorobenzene	ug/L	1	U	U	670	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1171 - Miscellaneous

ANALYTE	Units	PRR1WATCME-04	LQ	VQ	PRR1WATGACE-02	LQ	VQ	PRR1WATGACI-02	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			238			179		
Total Suspended Solids	mg/L	15			NA			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1171 - Miscellaneous

ANALYTE	Units	PRR1WATSP101-01	LQ	VQ
Chemical Oxygen Demand	mg/L	NA		
Total Suspended Solids	mg/L	56		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. _____ Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. _____ Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	
108-90-7	Chlorobenzene	670 ~~690~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-02DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	J D
108-90-7	Chlorobenzene	670	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03222012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1171

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-9981-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEA08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/23/2012

% Moisture: not dec. Date Analyzed: 03/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.: B0009964.0002.70004
PROJECT NAME: Tierra Phase I Removal
SAMPLERS:
SDG NUMBER: PRR1171
COC Number:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-02	3/22/2012	15:00	water	Grab	3	X																	
PRR1WATGACE-02	3/22/2012	15:10	water	Grab	3	X																	
TB03222012	3/22/2012	0:00	water	—	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/22/12	15 15	[signature]			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
			[signature] TALEE 3/23/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

Page 1 of 113

03/27/2012

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-02 Lab Sample ID: 200-10004-1

Lab Name: TestAmerica Burlington Job No.: 200-10004-1

SDG ID.: PRR1171

Matrix: Water Date Sampled: 03/22/2012 14:55

Reporting Basis: WET Date Received: 03/24/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	179	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-02 Lab Sample ID: 200-10004-2

Lab Name: TestAmerica Burlington Job No.: 200-10004-1

SDG ID.: PRR1171

Matrix: Water Date Sampled: 03/22/2012 14:55

Reporting Basis: WET Date Received: 03/24/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	238	80.0		mg/L			4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-04 Lab Sample ID: 460-38208-3

Lab Name: TestAmerica Edison Job No.: 460-38208-1

SDG ID.:

Matrix: Water Date Sampled: 03/22/2012 14:50

Reporting Basis: WET Date Received: 03/22/2012 16:07

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.0	10.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-01 Lab Sample ID: 460-38208-4

Lab Name: TestAmerica Edison Job No.: 460-38208-1

SDG ID.:

Matrix: Water Date Sampled: 03/22/2012 14:45

Reporting Basis: WET Date Received: 03/22/2012 16:07

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	56.0	10.0		mg/L			1	SM 2540D

T.A. Burlington

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

460-38208

PROJ. NO.: B0009964.0002.70004
PROJECT NAME: Tierra Phase I Removal
SAMPLERS:
SDG NUMBER: PRR1171
COC Number:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-02	3/22/2012	14:55	water	Grab	1		X																1 COD
PRR1WATGACE-02	3/22/2012	14:55	water	Grab	1		X																2 COD
PRR1WATCME-04	3/22/2012	14:50	water	Grab	1	X																	3 TSS
PRR1WATSP101-01	3/22/2012	14:45	water	Grab	1	X																	4 TSS

Requested Analyses

1 TSS
2 COD
3
4
7
5
6
7
8
9
10
11
12
13
14
15
16
17

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ
Shipping Tracking #
Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice
☐ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/22/12	1515	WAT	[signature] TestAmerica	3/23/12 1515	UPS
WAT	03/22/12	1530	[signature]			
[signature]	3/22/12	1607	[signature] 3/22/12			

Rec'd: [signature] TABER 3/24/12 0900

7 Day RUSH

5.4
#50

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1174 (200-10052 and 200-10075)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17112R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1174 (200-10052 and 200-10075) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-03	200-10052-1	Water	3/27/2012		X				X[1]
PRR1WATGACE-03	200-10052-2	Water	3/27/2012		X				X[1]
TB03272012	200-10052-3	Water	3/27/2012		X				
PRR1WATCME-05	460-38365-1	Water	3/23/2012						X[2]
PRR1WATCME-06	460-38365-2	Water	3/24/2012						X[2]
PRR1WATCME-07	460-38365-3	Water	3/26/2012						X[2]
PRR1WATCME-08	460-38365-4	Water	3/27/2012						X[2]
PRR1WATSP101-02	460-38365-7	Water	3/27/2012						X[2]

1. Miscellaneous parameters include Chemical Oxygen Demand (COD) by EPA Method 410.4
2. Miscellaneous parameters include Total Suspended Solids (TSS).
3. Volatiles by USEPA SOM0.1.2.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during Volatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

COD and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during COD and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin, Project Scientist

SIGNATURE: 

DATE: August 29, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - VOCs

ANALYTE	Units	PRR1WATGACE-03	LQ	VQ	PRR1WATGACI-03	LQ	VQ
2-Butanone	ug/L	10 U		U	10 U		U
Chlorobenzene	ug/L	1 U		U	2.3		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - Miscellaneous

ANALYTE	Units	PRR1WATCME-05	LQ	VQ	PRR1WATCME-06	LQ	VQ	PRR1WATCME-07	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			NA		
Total Suspended Solids	mg/L	13.2			13.2			15.6		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - Miscellaneous

ANALYTE	Units	PRR1WATCME-08	LQ	VQ	PRR1WATGACE-03	LQ	VQ	PRR1WATGACI-03	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			83.5			94.1		
Total Suspended Solids	mg/L	15.2			NA			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - Miscellaneous

ANALYTE	Units	PRR1WATSP101	LQ	VQ
Chemical Oxygen Demand	mg/L	NA		
Total Suspended Solids	mg/L	43		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1174

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10052-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEC08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/28/2012

% Moisture: not dec. Date Analyzed: 03/28/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	2.3	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1174

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10052-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEC09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/28/2012

% Moisture: not dec. Date Analyzed: 03/28/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03272012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1174

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10052-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEC10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/28/2012

% Moisture: not dec. Date Analyzed: 03/28/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-03 Lab Sample ID: 200-10075-1

Lab Name: TestAmerica Burlington Job No.: 200-10075-1

SDG ID.: PRR1174

Matrix: Water Date Sampled: 03/27/2012 14:50

Reporting Basis: WET Date Received: 03/29/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	94.1	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-03 Lab Sample ID: 200-10075-2

Lab Name: TestAmerica Burlington Job No.: 200-10075-1

SDG ID.: PRR1174

Matrix: Water Date Sampled: 03/27/2012 15:00

Reporting Basis: WET Date Received: 03/29/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	83.5	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-05 Lab Sample ID: 460-38365-1

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/23/2012 19:00

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.2	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-06
Lab Sample ID: 460-38365-2
Lab Name: TestAmerica Edison
Job No.: 460-38365-1
SDG ID.:
Matrix: Water
Date Sampled: 03/24/2012 23:00
Reporting Basis: WET
Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.2	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-07 Lab Sample ID: 460-38365-3

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/26/2012 19:25

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.6	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-08 Lab Sample ID: 460-38365-4

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/27/2012 15:10

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.2	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-02 Lab Sample ID: 460-38365-7

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/27/2012 14:45

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	43.0	10.0		mg/L			1	SM 2540D

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Syracuse, NY 13214
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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1174	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-03	3/27/2012	14:50	water	Grab	3	x																	
PRR1WATGACE-03	3/27/2012	15:00	water	Grab	3	x																	
TB03272012	3/27/2012	—	water	—	2	x																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	
3	
4	
7	
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9	
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11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/27/12	1530	[signature]			
[signature]	3/27/12	1540	[signature] 3/28/12 1015 TA BLR			

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # 38365

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal 0002.70004	PRR1174	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-05	3/23/2012	19:00	water	Grab	1	X																	1
PRR1WATCME-06	3/24/2012	23:00	water	Grab	1	X																	2
PRR1WATCME-07	3/26/2012	19:25	water	Grab	1	X																	3
PRR1WATCME-08	3/27/2012	15:10	water	Grab	1	X																	4
PRR1WATGACI-03	3/27/2012	14:50	water	Grab	1		X																5
PRR1WATGACE-03	3/27/2012	15:00	water	Grab	1		X																6
PRR1WATSP101-02	3/27/2012	14:45	water	Grab	1	X																	7

Requested Analyses	
1	TSS
2	COD
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

X: Analyze Now

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/27/12	1530	[signature]	[signature]	3/27/12	[signature] 1715 3/27/12 TA
[signature]	3/27/12	1546	[signature]	[signature]	3/27/12	
[signature]	3/28/12	12:30pm	UPS			[signature] 3/29/12 TA BLK 1020

5.0c

1 DAY RUSH

04/03/2012

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Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1174 (200-10052 and 200-10075)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17112R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1174 (200-10052 and 200-10075) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-03	200-10052-1	Water	3/27/2012		X				X[1]
PRR1WATGACE-03	200-10052-2	Water	3/27/2012		X				X[1]
TB03272012	200-10052-3	Water	3/27/2012		X				
PRR1WATCME-05	460-38365-1	Water	3/23/2012						X[2]
PRR1WATCME-06	460-38365-2	Water	3/24/2012						X[2]
PRR1WATCME-07	460-38365-3	Water	3/26/2012						X[2]
PRR1WATCME-08	460-38365-4	Water	3/27/2012						X[2]
PRR1WATSP101-02	460-38365-7	Water	3/27/2012						X[2]

1. Miscellaneous parameters include Chemical Oxygen Demand (COD) by EPA Method 410.4
2. Miscellaneous parameters include Total Suspended Solids (TSS).
3. Volatiles by USEPA SOM0.1.2.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during Volatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

COD and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during COD and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin, Project Scientist

SIGNATURE: 

DATE: August 29, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - VOCs

ANALYTE	Units	PRR1WATGACE-03	LQ	VQ	PRR1WATGACI-03	LQ	VQ
2-Butanone	ug/L	10 U		U	10 U		U
Chlorobenzene	ug/L	1 U		U	2.3		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - Miscellaneous

ANALYTE	Units	PRR1WATCME-05	LQ	VQ	PRR1WATCME-06	LQ	VQ	PRR1WATCME-07	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			NA		
Total Suspended Solids	mg/L	13.2			13.2			15.6		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - Miscellaneous

ANALYTE	Units	PRR1WATCME-08	LQ	VQ	PRR1WATGACE-03	LQ	VQ	PRR1WATGACI-03	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			83.5			94.1		
Total Suspended Solids	mg/L	15.2			NA			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1174 - Miscellaneous

ANALYTE	Units	PRR1WATSP101	LQ	VQ
Chemical Oxygen Demand	mg/L	NA		
Total Suspended Solids	mg/L	43		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1174

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10052-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEC08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/28/2012

% Moisture: not dec. Date Analyzed: 03/28/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	2.3	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1174

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10052-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEC09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/28/2012

% Moisture: not dec. Date Analyzed: 03/28/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03272012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1174

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10052-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEC10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 03/28/2012

% Moisture: not dec. Date Analyzed: 03/28/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-03 Lab Sample ID: 200-10075-1

Lab Name: TestAmerica Burlington Job No.: 200-10075-1

SDG ID.: PRR1174

Matrix: Water Date Sampled: 03/27/2012 14:50

Reporting Basis: WET Date Received: 03/29/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	94.1	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-03 Lab Sample ID: 200-10075-2

Lab Name: TestAmerica Burlington Job No.: 200-10075-1

SDG ID.: PRR1174

Matrix: Water Date Sampled: 03/27/2012 15:00

Reporting Basis: WET Date Received: 03/29/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	83.5	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-05 Lab Sample ID: 460-38365-1

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/23/2012 19:00

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.2	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-06
Lab Sample ID: 460-38365-2
Lab Name: TestAmerica Edison
Job No.: 460-38365-1
SDG ID.:
Matrix: Water
Date Sampled: 03/24/2012 23:00
Reporting Basis: WET
Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.2	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-07 Lab Sample ID: 460-38365-3

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/26/2012 19:25

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.6	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-08 Lab Sample ID: 460-38365-4

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/27/2012 15:10

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.2	4.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-02 Lab Sample ID: 460-38365-7

Lab Name: TestAmerica Edison Job No.: 460-38365-1

SDG ID.:

Matrix: Water Date Sampled: 03/27/2012 14:45

Reporting Basis: WET Date Received: 03/27/2012 17:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	43.0	10.0		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1174	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-03	3/27/2012	14:50	water	Grab	3	x																	
PRR1WATGACE-03	3/27/2012	15:00	water	Grab	3	x																	
TB03272012	3/27/2012	—	water	—	2	x																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/27/12	1530	[signature]			
[signature]	3/27/12	1540	[signature] 3/28/12 1015 TA BLR			

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # 38365

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal 0002.70004	PRR1174	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-05	3/23/2012	19:00	water	Grab	1	X																	1
PRR1WATCME-06	3/24/2012	23:00	water	Grab	1	X																	2
PRR1WATCME-07	3/26/2012	19:25	water	Grab	1	X																	3
PRR1WATCME-08	3/27/2012	15:10	water	Grab	1	X																	4
PRR1WATGACI-03	3/27/2012	14:50	water	Grab	1		X																5
PRR1WATGACE-03	3/27/2012	15:00	water	Grab	1		X																6
PRR1WATSP101-02	3/27/2012	14:45	water	Grab	1	X																	7

Requested Analyses	
1	TSS
2	COD
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

X: Analyze Now

Laboratory Information and Receipt

Lab Name: TestAmerica - Edison, NJ

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/27/12	1530	[signature]	[signature]	3/27/12	[signature] 1715 3/27/12 TA
[signature]	3/27/12	1546	[signature]	[signature]	3/27/12	
[signature]	3/28/12	12:30pm	UPS			[signature] 3/29/12 TA BLK 1020

5.0c

1 DAY RUSH

04/03/2012

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Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1180 (200-10136)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17113R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1180 (200-10136) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATCME-10	200-10136-1	Water	3/29/2012						X
PRR1WATCME-11	200-10136-2	Water	3/30/2012						X
PRR1WATCME-12	200-10136-3	Water	3/31/2012						X
PRR1WATGACI-04	200-10136-4	Water	3/31/2012		X				X
PRR1WATGACE-04	200-10136-5	Water	3/31/2012		X				X
PRR1WATSP101-03	200-10136-6	Water	3/31/2012						X
TB03312012	200-10136-7	Water	3/31/2012		X				

1. Volatiles by USEPA SOM0.1.2
2. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D and Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-04	Chlorobenzene	49 E	50 D	50 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS and COD DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or COD analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed on sample PRR1WATGACE-04 for COD analysis. Recoveries were observed within acceptable limits.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATGACE-04 was selected for the duplicate analysis for COD. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

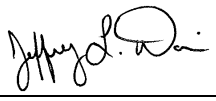
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 29, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1180 - VOCs

ANALYTE	Units	PRR1WATGACE-04	LQ	VQ	PRR1WATGACI-04	LQ	VQ
2-Butanone	ug/L	10	U	U	9.9	J	J
Chlorobenzene	ug/L	0.18	J	J	50	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1180 - Miscellaneous

ANALYTE	Units	PRR1WATCME-10	LQ	VQ	PRR1WATCME-11	LQ	VQ	PRR1WATCME-12	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			NA		
Total Suspended Solids	mg/L	1.9	U	U	4.3			6.6		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1180 - Miscellaneous

ANALYTE	Units	PRR1WATGACE-04	LQ	VQ	PRR1WATGACI-04	LQ	VQ	PRR1WATSP101-3	LQ	VQ
Chemical Oxygen Demand	mg/L	101			115			NA		
Total Suspended Solids	mg/L	NA			NA			61.7		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1180

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10136-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. _____ Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	0.18	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1180

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10136-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. _____ Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	9.9	J
108-90-7	Chlorobenzene	50 ~~49~~	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-04DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1180

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10136-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	14	J D
108-90-7	Chlorobenzene	50	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03312012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1180

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10136-7

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. _____ Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-10 | Lab Sample ID: 200-10136-1

Lab Name: TestAmerica Burlington | Job No.: 200-10136-2

SDG ID.: PRR1180

Matrix: Water | Date Sampled: 03/29/2012 22:00

Reporting Basis: WET | Date Received: 04/02/2012 07:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	1.9	1.9		mg/L	U		1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-11 Lab Sample ID: 200-10136-2

Lab Name: TestAmerica Burlington Job No.: 200-10136-2

SDG ID.: PRR1180

Matrix: Water Date Sampled: 03/30/2012 23:00

Reporting Basis: WET Date Received: 04/02/2012 07:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	4.3	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-12 Lab Sample ID: 200-10136-3

Lab Name: TestAmerica Burlington Job No.: 200-10136-2

SDG ID.: PRR1180

Matrix: Water Date Sampled: 03/31/2012 14:25

Reporting Basis: WET Date Received: 04/02/2012 07:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.6	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-04 Lab Sample ID: 200-10136-4

Lab Name: TestAmerica Burlington Job No.: 200-10136-2

SDG ID.: PRR1180

Matrix: Water Date Sampled: 03/31/2012 14:10

Reporting Basis: WET Date Received: 04/02/2012 07:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	115	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-04 Lab Sample ID: 200-10136-5

Lab Name: TestAmerica Burlington Job No.: 200-10136-2

SDG ID.: PRR1180

Matrix: Water Date Sampled: 03/31/2012 14:00

Reporting Basis: WET Date Received: 04/02/2012 07:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	101	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-03 | Lab Sample ID: 200-10136-6

Lab Name: TestAmerica Burlington | Job No.: 200-10136-2

SDG ID.: PRR1180

Matrix: Water | Date Sampled: 03/31/2012 13:45

Reporting Basis: WET | Date Received: 04/02/2012 07:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	61.7	3.1		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1180	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-10	3/29/2012	22:00	water	Grab	1			X															
PRR1WATCME-11	3/30/2012	23:00	water	Grab	1			X															
PRR1WATCME-12	3/31/2012	14:25	water	Grab	1			X															
PRR1WATGACI-04	3/31/2012	14:10	water	Grab	4	X	X																
PRR1WATGACE-04	3/31/2012	14:00	water	Grab	4	X	X																
PRR1WATCME-09	3/31/2012	14:20	water	Grab	3				X														
PRR1WATCMI-09	3/31/2012	13:50	water	Grab	3				X														
PRR1WATSP101-03	3/31/2012	13:45	water	Grab	1			X															
TB03312012	3/31/2012		water	—	2	X																	

Page 7 of 108

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	COD
3	TSS
4	VOCs - see WS 15-4 for effluent and WS 15-5 for influent
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT for 2-butanone, chlorobenzene
24 hr TAT for COD, TSS. 7 day TAT for VOCs (CME-09, CMI-09)

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 3.8°C ok!

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	03/31/2012	1530	[signature]			
[signature]	03/31/2012	1600	[signature] 4/2/12 735 TA BUR			

04/03/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1177 (200-10092)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17131R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1177 (200-10092) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-09	200-10092-1	Water	3/28/2012		X	X	X	X	X
PRR1WATCMI-09	200-10092-2	Water	3/28/2012		X	X	X		
TB03312012	200-10092-3	Water	3/31/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in one sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

The method blank exhibited concentrations less than the PQL for butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in sample PRR1WATCME-09 at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

Compounds were detected in the associated trip blank; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC. This compound was detected in one sample at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

Two sample locations exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for beta-BHC. This compound was detected in sample PRR1WATCME-09 at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. This compound is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-09	2,4-DDT	158.7%
	2,4-DDD	127.3%
	Heptachlor epoxide	116.6%

Sample Locations	Compound	%D
	4,4'-DDE	81.4%
	4,4'-DDD	65.0%
	4,4'-DDT	69.9%
PRR1WATCMI-09	2,4-DDE	616.5%
	2,4-DDD	48.7%
	2,4-DDT	59.3%
	delta-BHC	999.9%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.

Qualifier	Description
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Antimony, Chromium, Lead and Mercury. These analytes were detected in one sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Antimony, Chromium, Lead and Mercury. These analytes were detected in sample PRR1WATCME-09 at concentrations less than five times the method blank concentration; therefore, these analytes in the sample are most likely from laboratory contamination. The sample result is reported at the PQL (or at the detected sample concentration if above the PQL) and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. SERIAL DILUTION

Sample PRR1WATCME-09 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria.

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TOC and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

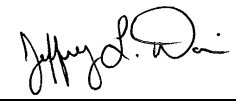
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 31, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - PCBs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ
Aroclor-1016	ug/L	0.95 U		U
Aroclor-1221	ug/L	0.95 U		U
Aroclor-1232	ug/L	0.95 U		U
Aroclor-1242	ug/L	0.95 U		U
Aroclor-1248	ug/L	0.95 U		U
Aroclor-1254	ug/L	0.95 U		U
Aroclor-1260	ug/L	0.95 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Pesticides

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,4'-DDD	ug/L	0.0095	J P	U	0.039	J P	J
2,4'-DDE	ug/L	0.0095	U	U	0.1	J P	U
2,4'-DDT	ug/L	0.0095	J P	U	0.1	J P	U
4,4'-DDD	ug/L	0.0095	J P	U	NA		
4,4'-DDE	ug/L	0.0095	J P	U	NA		
4,4'-DDT	ug/L	0.0095	J P	U	NA		
Aldrin	ug/L	0.0048	U	U	NA		
Alpha-BHC	ug/L	0.0048	U	U	NA		
Alpha-Chlordane	ug/L	0.0048	U	U	NA		
Beta-BHC	ug/L	0.0048	J P B	UB	NA		
Delta-BHC	ug/L	0.0048	U	U	0.051	J P	U
Dieldrin	ug/L	0.0095	U	U	NA		
Endosulfan I	ug/L	0.0048	U	U	NA		
Endosulfan II	ug/L	0.0095	U	U	NA		
Endosulfan Sulfate	ug/L	0.0095	U	U	NA		
Endrin	ug/L	0.0095	U	U	NA		
Endrin Aldehyde	ug/L	0.0095	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0048	U	U	NA		
Gamma-Chlordane	ug/L	0.0048	U	U	NA		
Heptachlor	ug/L	0.0048	U	U	NA		
Heptachlor Epoxide	ug/L	0.0048	J P	U	NA		
Toxaphene	ug/L	0.48	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Herbicides

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,4,5-T	ug/L	0.46	U	U	34		
2,4-D	ug/L	1.9	U	U	NA		
2,4-DB	ug/L	1.7	U	U	NA		
Dinoseb	ug/L	0.93	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - VOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	1	U	U	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	10	U	U	10	U	U
Acrolein	ug/L	20	U	U	NA		
Acrylonitrile	ug/L	20	U	U	NA		
Benzene	ug/L	1	U	U	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	U	U	NA		
Chlorobenzene	ug/L	1	U	U	NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	1	U	U	NA		
Chloromethane	ug/L	1	U	U	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	1	U	U	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	1	U	U	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - VOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - SVOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U	NA		
2,4,5-Trichlorophenol	ug/L	4.8	U	U	3.0	J	J
2,4,6-Trichlorophenol	ug/L	4.8	U	U	NA		
2,4-Dichlorophenol	ug/L	4.8	U	U	NA		
2,4-Dimethylphenol	ug/L	4.8	U	U	NA		
2,4-Dinitrophenol	ug/L	9.6	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.8	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.8	U	U	NA		
2-Chlorophenol	ug/L	4.8	U	U	NA		
2-Nitrophenol	ug/L	4.8	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.8	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.6	U	U	10	U	U
4-Nitrophenol	ug/L	9.6	U	U	NA		
Anthracene	ug/L	4.8	U	U	NA		
Benzidine	ug/L	9.6	U	U	NA		
Benzo(a)anthracene	ug/L	4.8	U	U	NA		
Benzo(a)pyrene	ug/L	4.8	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.8	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.8	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.8	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	4.8	U	UB	NA		
Butylbenzylphthalate	ug/L	4.8	J B	UB	NA		
Chrysene	ug/L	4.8	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.8	U	U	NA		
Diethylphthalate	ug/L	4.8	U	U	NA		
Dimethylphthalate	ug/L	4.8	U	U	NA		
Di-n-Butylphthalate	ug/L	4.8	U	UB	NA		
Fluoranthene	ug/L	4.8	U	U	NA		
Fluorene	ug/L	4.8	U	U	NA		
Hexachlorobenzene	ug/L	4.8	U	U	NA		
Hexachlorobutadiene	ug/L	4.8	U	U	NA		
Hexachlorocyclopentadiene	ug/L	4.8	U	U	NA		
Hexachloroethane	ug/L	4.8	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - SVOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U	NA		
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U	NA		
Isophorone	ug/L	4.8	U	U	NA		
Naphthalene	ug/L	4.8	U	U	NA		
Nitrobenzene	ug/L	4.8	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.6	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.8	U	U	NA		
Pentachlorophenol	ug/L	9.6	U	U	NA		
Phenanthrene	ug/L	4.8	U	U	NA		
Phenol	ug/L	4.8	U	U	NA		
Pyrene	ug/L	4.8	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Inorganics

ANALYTE	Units	PRR1WATCME-09	LQ	VQ
Antimony	ug/L	3.8		UB
Arsenic	ug/L	6.4		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2.8		UB
Copper	ug/L	6.2		
Cyanide	ug/L	10	U	U
Lead	ug/L	1.1		UB
Mercury	ug/L	0.2	J	UB
Nickel	ug/L	25.1		
Selenium	ug/L	16		
Silver	ug/L	1	U	U
Zinc	ug/L	12.6		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Miscellaneous

ANALYTE	Units	PRR1WATCME-09	LQ	VQ
Total Organic Carbon	mg/L	3.3		
Total Suspended Solids	mg/L	8.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1
Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJY14.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 03/29/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/29/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/06/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.6	U
108-95-2	Phenol	4.8	U
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	4.8	U
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	4.8	U
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	4.8	U
95-95-4	2,4,5-Trichlorophenol	4.8	U
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.6	U
100-02-7	4-Nitrophenol	9.6	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	4.8	U
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.6	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.6	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8 ~~0.23~~	~~J B~~ U B
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.6	U
129-00-0	Pyrene	4.8	U

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJY14.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/29/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/06/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8 ~~0.39~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	4.8 ~~0.89~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-2

Sample wt/vol: 975 (g/mL) mL Lab File ID: RJY16.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/29/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/06/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	3.0	J
534-52-1	4,6-Dinitro-2-methylphenol	10	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	1.0	U
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03312012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	1.3	J
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.41	J
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.076	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03312012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.35	J
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 30MA121202-R081.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 03/29/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.0095	U
789-02-6	2,4'-DDT	0.0095 ~~0.00061~~	~~J P~~ U
53-19-0	2,4'-DDD	0.0095 ~~0.00067~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 30MA121738-R081.D

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.0048		U
319-85-7	beta-BHC	0.0048	~~0.0011~~	~~J P B~~ U B
319-86-8	delta-BHC	0.0048		U
58-89-9	gamma-BHC (Lindane)	0.0048		U
76-44-8	Heptachlor	0.0048		U
309-00-2	Aldrin	0.0048		U
1024-57-3	Heptachlor epoxide	0.0048	~~0.00034~~	~~J P~~ U
959-98-8	Endosulfan I	0.0048		U
60-57-1	Dieldrin	0.0095		U
72-55-9	4,4'-DDE	0.0095	~~0.00032~~	~~J P~~ U
72-20-8	Endrin	0.0095		U
33213-65-9	Endosulfan II	0.0095		U
72-54-8	4,4'-DDD	0.0095	~~0.0011~~	~~J P~~ U
1031-07-8	Endosulfan sulfate	0.0095		U
50-29-3	4,4'-DDT	0.0095	~~0.0017~~	~~J P~~ U
7421-93-4	Endrin aldehyde	0.0095		U
5103-71-9	alpha-Chlordane	0.0048		U
5103-74-2	gamma-Chlordane	0.0048		U
8001-35-2	Toxaphene	0.48		U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-2

Sample wt/vol: 975 (g/mL) mL Lab File ID: 30MA121202-R051.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/29/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
3424-82-6	2,4'-DDE	0.10	~~0.0096~~	~~J P~~ U
53-19-0	2,4'-DDD		0.039	J P
789-02-6	2,4'-DDT	0.10	~~0.019~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-2

Sample wt/vol: 975 (g/mL) mL Lab File ID: 30MA121738-R051.D

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/29/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.051 ~~0.018~~	~~J P~~ U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 30MA121104-R051.D

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/30/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.95	U
11104-28-2	Aroclor-1221	0.95	U
11141-16-5	Aroclor-1232	0.95	U
53469-21-9	Aroclor-1242	0.95	U
12672-29-6	Aroclor-1248	0.95	U
11097-69-1	Aroclor-1254	0.95	U
11096-82-5	Aroclor-1260	0.95	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10092-2

SDG No.: PRR1177

Client Sample ID: PRR1WATCME-09 Lab Sample ID: 200-10092-1

Matrix: Water Lab File ID: 02ap121258-r101.d

Analysis Method: 8151A Date Collected: 03/28/2012 11:45

Extraction Method: 8151A Date Extracted: 03/30/2012 10:20

Sample wt/vol: 1025(mL) Date Analyzed: 04/02/2012 18:43

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36107 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.9	U	1.9	0.63
94-82-6	2,4-DB	1.7	U	1.7	0.46
88-85-7	Dinoseb	0.93	U	0.93	0.19
93-76-5	2,4,5-T	0.46	U	0.46	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	71		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-10092-2

SDG No.: PRR1177

Client Sample ID: PRR1WATCMI-09 | Lab Sample ID: 200-10092-2

Matrix: Water | Lab File ID: 02ap121258-r111.d

Analysis Method: 8151A | Date Collected: 03/28/2012 12:05

Extraction Method: 8151A | Date Extracted: 03/30/2012 10:20

Sample wt/vol: 1020(mL) | Date Analyzed: 04/02/2012 19:18

Con. Extract Vol.: 10000(uL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 36107 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	34		4.6	1.3

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	84		60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1177
Matrix: WATER Lab Sample Id: 200-10092-1
% Solids: Date Received: 03/29/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.8		4B	MS
7440-38-2	Arsenic	6.4			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.8		4B	MS
7440-50-8	Copper	6.2			MS
7439-92-1	Lead	1.1		4B	MS
7440-02-0	Nickel	25.1			MS
7782-49-2	Selenium	16.0			MS
7440-22-4	Silver	1.0	U		MS
7440-66-6	Zinc	12.6			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1177
Matrix: WATER Lab Sample Id: 200-10092-1
% Solids: Date Received: 03/29/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20 ~~0.11~~	~~J~~	UB	CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1177
Matrix: WATER Lab Sample Id: 200-10092-1
% Solids: Date Received: 03/29/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-09 Lab Sample ID: 200-10092-1

Lab Name: TestAmerica Burlington Job No.: 200-10092-2

SDG ID.: PRR1177

Matrix: Water Date Sampled: 03/28/2012 11:45

Reporting Basis: WET Date Received: 03/29/2012 10:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	3.3	1.0	0.14	mg/L			1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-09 Lab Sample ID: 200-10087-1

Lab Name: TestAmerica Burlington Job No.: 200-10087-1

SDG ID.: PRR1177

Matrix: Water Date Sampled: 03/28/2012 11:45

Reporting Basis: WET Date Received: 03/29/2012 10:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	8.2	1.0		mg/L			1	SM 2540D

ARCADIS
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1177	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-09	3/28/2012	11:45	water	Grab		X	X	X	X	X	X	X	X	X									
PRR1WATCMI-09	3/28/2012	12:05	water	Grab			X	X		X			X										
TB03282012	3/28/2012		water	—	3	X																	

	Requested Analyses
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP Worksheet 15-4 for Effluent Samples and 15-5 for Influent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

x☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 4.6

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/28/12	1400				[signature] 3/29/12 TA BUR 1030
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

Page 5 of 22

04/02/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1177 (200-10092)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17131R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1177 (200-10092) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-09	200-10092-1	Water	3/28/2012		X	X	X	X	X
PRR1WATCMI-09	200-10092-2	Water	3/28/2012		X	X	X		
TB03312012	200-10092-3	Water	3/31/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in one sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

The method blank exhibited concentrations less than the PQL for butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in sample PRR1WATCME-09 at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

Compounds were detected in the associated trip blank; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC. This compound was detected in one sample at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

Two sample locations exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for beta-BHC. This compound was detected in sample PRR1WATCME-09 at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. This compound is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-09	2,4-DDT	158.7%
	2,4-DDD	127.3%
	Heptachlor epoxide	116.6%

Sample Locations	Compound	%D
	4,4'-DDE	81.4%
	4,4'-DDD	65.0%
	4,4'-DDT	69.9%
PRR1WATCMI-09	2,4-DDE	616.5%
	2,4-DDD	48.7%
	2,4-DDT	59.3%
	delta-BHC	999.9%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.

Qualifier	Description
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank had observed surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Antimony, Chromium, Lead and Mercury. These analytes were detected in one sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Antimony, Chromium, Lead and Mercury. These analytes were detected in sample PRR1WATCME-09 at concentrations less than five times the method blank concentration; therefore, these analytes in the sample are most likely from laboratory contamination. The sample result is reported at the PQL (or at the detected sample concentration if above the PQL) and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. SERIAL DILUTION

Sample PRR1WATCME-09 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained for all analytes met method measurement performance criteria.

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TOC and TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

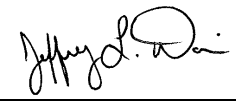
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: August 31, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - PCBs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ
Aroclor-1016	ug/L	0.95 U		U
Aroclor-1221	ug/L	0.95 U		U
Aroclor-1232	ug/L	0.95 U		U
Aroclor-1242	ug/L	0.95 U		U
Aroclor-1248	ug/L	0.95 U		U
Aroclor-1254	ug/L	0.95 U		U
Aroclor-1260	ug/L	0.95 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Pesticides

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,4'-DDD	ug/L	0.0095	J P	U	0.039	J P	J
2,4'-DDE	ug/L	0.0095	U	U	0.1	J P	U
2,4'-DDT	ug/L	0.0095	J P	U	0.1	J P	U
4,4'-DDD	ug/L	0.0095	J P	U	NA		
4,4'-DDE	ug/L	0.0095	J P	U	NA		
4,4'-DDT	ug/L	0.0095	J P	U	NA		
Aldrin	ug/L	0.0048	U	U	NA		
Alpha-BHC	ug/L	0.0048	U	U	NA		
Alpha-Chlordane	ug/L	0.0048	U	U	NA		
Beta-BHC	ug/L	0.0048	J P B	UB	NA		
Delta-BHC	ug/L	0.0048	U	U	0.051	J P	U
Dieldrin	ug/L	0.0095	U	U	NA		
Endosulfan I	ug/L	0.0048	U	U	NA		
Endosulfan II	ug/L	0.0095	U	U	NA		
Endosulfan Sulfate	ug/L	0.0095	U	U	NA		
Endrin	ug/L	0.0095	U	U	NA		
Endrin Aldehyde	ug/L	0.0095	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0048	U	U	NA		
Gamma-Chlordane	ug/L	0.0048	U	U	NA		
Heptachlor	ug/L	0.0048	U	U	NA		
Heptachlor Epoxide	ug/L	0.0048	J P	U	NA		
Toxaphene	ug/L	0.48	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Herbicides

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,4,5-T	ug/L	0.46	U	U	34		
2,4-D	ug/L	1.9	U	U	NA		
2,4-DB	ug/L	1.7	U	U	NA		
Dinoseb	ug/L	0.93	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - VOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	1	U	U	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	10	U	U	10	U	U
Acrolein	ug/L	20	U	U	NA		
Acrylonitrile	ug/L	20	U	U	NA		
Benzene	ug/L	1	U	U	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	U	U	NA		
Chlorobenzene	ug/L	1	U	U	NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	1	U	U	NA		
Chloromethane	ug/L	1	U	U	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	1	U	U	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	1	U	U	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - VOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - SVOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U	NA		
2,4,5-Trichlorophenol	ug/L	4.8	U	U	3.0	J	J
2,4,6-Trichlorophenol	ug/L	4.8	U	U	NA		
2,4-Dichlorophenol	ug/L	4.8	U	U	NA		
2,4-Dimethylphenol	ug/L	4.8	U	U	NA		
2,4-Dinitrophenol	ug/L	9.6	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.8	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.8	U	U	NA		
2-Chlorophenol	ug/L	4.8	U	U	NA		
2-Nitrophenol	ug/L	4.8	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.8	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.6	U	U	10	U	U
4-Nitrophenol	ug/L	9.6	U	U	NA		
Anthracene	ug/L	4.8	U	U	NA		
Benzidine	ug/L	9.6	U	U	NA		
Benzo(a)anthracene	ug/L	4.8	U	U	NA		
Benzo(a)pyrene	ug/L	4.8	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.8	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.8	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.8	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	4.8	U	UB	NA		
Butylbenzylphthalate	ug/L	4.8	J B	UB	NA		
Chrysene	ug/L	4.8	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.8	U	U	NA		
Diethylphthalate	ug/L	4.8	U	U	NA		
Dimethylphthalate	ug/L	4.8	U	U	NA		
Di-n-Butylphthalate	ug/L	4.8	U	UB	NA		
Fluoranthene	ug/L	4.8	U	U	NA		
Fluorene	ug/L	4.8	U	U	NA		
Hexachlorobenzene	ug/L	4.8	U	U	NA		
Hexachlorobutadiene	ug/L	4.8	U	U	NA		
Hexachlorocyclopentadiene	ug/L	4.8	U	U	NA		
Hexachloroethane	ug/L	4.8	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - SVOCs

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U	NA		
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U	NA		
Isophorone	ug/L	4.8	U	U	NA		
Naphthalene	ug/L	4.8	U	U	NA		
Nitrobenzene	ug/L	4.8	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.6	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.8	U	U	NA		
Pentachlorophenol	ug/L	9.6	U	U	NA		
Phenanthrene	ug/L	4.8	U	U	NA		
Phenol	ug/L	4.8	U	U	NA		
Pyrene	ug/L	4.8	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Inorganics

ANALYTE	Units	PRR1WATCME-09	LQ	VQ
Antimony	ug/L	3.8		UB
Arsenic	ug/L	6.4		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2.8		UB
Copper	ug/L	6.2		
Cyanide	ug/L	10	U	U
Lead	ug/L	1.1		UB
Mercury	ug/L	0.2	J	UB
Nickel	ug/L	25.1		
Selenium	ug/L	16		
Silver	ug/L	1	U	U
Zinc	ug/L	12.6		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1177 - Miscellaneous

ANALYTE	Units	PRR1WATCME-09	LQ	VQ
Total Organic Carbon	mg/L	3.3		
Total Suspended Solids	mg/L	8.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1
Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJY14.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 03/29/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/29/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/06/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.6	U
108-95-2	Phenol	4.8	U
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	4.8	U
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	4.8	U
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	4.8	U
95-95-4	2,4,5-Trichlorophenol	4.8	U
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.6	U
100-02-7	4-Nitrophenol	9.6	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	4.8	U
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.6	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.6	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8 ~~0.23~~	~~J B~~ U B
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.6	U
129-00-0	Pyrene	4.8	U

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJY14.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/29/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/06/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8 ~~0.39~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	4.8 ~~0.89~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-2

Sample wt/vol: 975 (g/mL) mL Lab File ID: RJY16.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 03/29/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/06/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	3.0	J
534-52-1	4,6-Dinitro-2-methylphenol	10	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	1.0	U
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB03312012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	1.3	J
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.41	J
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.076	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB03312012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10140-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEE20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/02/2012

% Moisture: not dec. Date Analyzed: 04/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.35	J
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 30MA121202-R081.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 03/29/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.0095	U
789-02-6	2,4'-DDT	0.0095 ~~0.00061~~	~~J P~~ U
53-19-0	2,4'-DDD	0.0095 ~~0.00067~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 30MA121738-R081.D

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/29/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.0048		U
319-85-7	beta-BHC	0.0048	~~0.0011~~	~~J P B~~ U B
319-86-8	delta-BHC	0.0048		U
58-89-9	gamma-BHC (Lindane)	0.0048		U
76-44-8	Heptachlor	0.0048		U
309-00-2	Aldrin	0.0048		U
1024-57-3	Heptachlor epoxide	0.0048	~~0.00034~~	~~J P~~ U
959-98-8	Endosulfan I	0.0048		U
60-57-1	Dieldrin	0.0095		U
72-55-9	4,4'-DDE	0.0095	~~0.00032~~	~~J P~~ U
72-20-8	Endrin	0.0095		U
33213-65-9	Endosulfan II	0.0095		U
72-54-8	4,4'-DDD	0.0095	~~0.0011~~	~~J P~~ U
1031-07-8	Endosulfan sulfate	0.0095		U
50-29-3	4,4'-DDT	0.0095	~~0.0017~~	~~J P~~ U
7421-93-4	Endrin aldehyde	0.0095		U
5103-71-9	alpha-Chlordane	0.0048		U
5103-74-2	gamma-Chlordane	0.0048		U
8001-35-2	Toxaphene	0.48		U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-2

Sample wt/vol: 975 (g/mL) mL Lab File ID: 30MA121202-R051.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/29/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
3424-82-6	2,4'-DDE	0.10	~~0.0096~~	~~J P~~ U
53-19-0	2,4'-DDD		0.039	J P
789-02-6	2,4'-DDT	0.10	~~0.019~~	~~J P~~ U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-2

Sample wt/vol: 975 (g/mL) mL Lab File ID: 30MA121738-R051.D

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/29/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.051 ~~0.018~~	~~J P~~ U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1177

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10092-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 30MA121104-R051.D

% Moisture: Decanted: (Y/N) Date Received: 03/29/2012

Extraction: (Type) SEPF Date Extracted: 03/30/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 03/30/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.95	U
11104-28-2	Aroclor-1221	0.95	U
11141-16-5	Aroclor-1232	0.95	U
53469-21-9	Aroclor-1242	0.95	U
12672-29-6	Aroclor-1248	0.95	U
11097-69-1	Aroclor-1254	0.95	U
11096-82-5	Aroclor-1260	0.95	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10092-2

SDG No.: PRR1177

Client Sample ID: PRR1WATCME-09 Lab Sample ID: 200-10092-1

Matrix: Water Lab File ID: 02ap121258-r101.d

Analysis Method: 8151A Date Collected: 03/28/2012 11:45

Extraction Method: 8151A Date Extracted: 03/30/2012 10:20

Sample wt/vol: 1025(mL) Date Analyzed: 04/02/2012 18:43

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36107 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.9	U	1.9	0.63
94-82-6	2,4-DB	1.7	U	1.7	0.46
88-85-7	Dinoseb	0.93	U	0.93	0.19
93-76-5	2,4,5-T	0.46	U	0.46	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	71		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-10092-2

SDG No.: PRR1177

Client Sample ID: PRR1WATCMI-09 | Lab Sample ID: 200-10092-2

Matrix: Water | Lab File ID: 02ap121258-r111.d

Analysis Method: 8151A | Date Collected: 03/28/2012 12:05

Extraction Method: 8151A | Date Extracted: 03/30/2012 10:20

Sample wt/vol: 1020(mL) | Date Analyzed: 04/02/2012 19:18

Con. Extract Vol.: 10000(uL) | Dilution Factor: 10

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 36107 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	34		4.6	1.3

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	84		60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1177
Matrix: WATER Lab Sample Id: 200-10092-1
% Solids: Date Received: 03/29/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.8		4B	MS
7440-38-2	Arsenic	6.4			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.8		4B	MS
7440-50-8	Copper	6.2			MS
7439-92-1	Lead	1.1		4B	MS
7440-02-0	Nickel	25.1			MS
7782-49-2	Selenium	16.0			MS
7440-22-4	Silver	1.0	U		MS
7440-66-6	Zinc	12.6			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1177
Matrix: WATER Lab Sample Id: 200-10092-1
% Solids: Date Received: 03/29/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20 ~~0.11~~	~~J~~	UB	CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1177
Matrix: WATER Lab Sample Id: 200-10092-1
% Solids: Date Received: 03/29/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-09 Lab Sample ID: 200-10092-1

Lab Name: TestAmerica Burlington Job No.: 200-10092-2

SDG ID.: PRR1177

Matrix: Water Date Sampled: 03/28/2012 11:45

Reporting Basis: WET Date Received: 03/29/2012 10:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	3.3	1.0	0.14	mg/L			1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-09 Lab Sample ID: 200-10087-1

Lab Name: TestAmerica Burlington Job No.: 200-10087-1

SDG ID.: PRR1177

Matrix: Water Date Sampled: 03/28/2012 11:45

Reporting Basis: WET Date Received: 03/29/2012 10:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	8.2	1.0		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1177	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-09	3/28/2012	11:45	water	Grab		X	X	X	X	X	X	X	X	X									
PRR1WATCMI-09	3/28/2012	12:05	water	Grab			X	X		X			X										
TB03282012	3/28/2012		water	—	3	X																	

	Requested Analyses
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP Worksheet 15-4 for Effluent Samples and 15-5 for Influent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

x☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 4.6

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	3/28/12	1400				[signature] 3/29/12 TA BUR 1030
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

Page 5 of 22

04/02/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1168 (33662)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17154R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1168 (33662) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1WATCME-03	200-9960-1	Water	3/21/2012				X		X
PRR1WATCMI-03	200-9964-1	Water	3/22/2012				X		X

1. PCDD/PCDF by EPA Method 1613.
2. PCB Congener by EPA Method 1668.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in the sample PRR1WATCMI-03 and confirmation analysis was performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-03	2,3,7,8-TCDD	4130 E	--	4130 EJ

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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-03	PCB-18	24200 E	--	24200 EJ

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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory added the qualifier "I" which is defined by the laboratory as "Chemical Interference." These samples results were qualified as estimated (J).

The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin, Project Scientist

SIGNATURE: 

DATE: September 9, 2012

PEER REVIEW: Dennis Capria

DATE: October 1, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - PCB Congeners

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
PCB-1	pg/L	5.29	U	U	4510		
PCB-2	pg/L	5.29	U	U	944		
PCB-3	pg/L	5.29	U	U	828		
PCB-4/10	pg/L	19.1			9700		
PCB-5/8	pg/L	39.3			15300		
PCB-6	pg/L	13.3			5170		
PCB-7/9	pg/L	10.6	U	U	2170		
PCB-11	pg/L	26.9			3670		
PCB-12/13	pg/L	10.6	U	U	1610		
PCB-14	pg/L	10.6	U	U	244		
PCB-15	pg/L	10.6	U	U	2540		
PCB-16/32	pg/L	116			13700		
PCB-17	pg/L	83.5			10200		
PCB-18	pg/L	187			24200	E	EJ
PCB-19	pg/L	19.9			2560		
PCB-20/21/33	pg/L	114			13300		
PCB-22	pg/L	75.9			8830		
PCB-23	pg/L	5.29	U	U	45.6		
PCB-24/27	pg/L	15.3			1750		
PCB-25	pg/L	28.2			3060		
PCB-26	pg/L	35.6			3410		
PCB-28	pg/L	191			19700		
PCB-29	pg/L	5.29	U	U	168		
PCB-30	pg/L	5.29	U	U	27		
PCB-31	pg/L	213			18000		
PCB-34	pg/L	1.96	J	J	188		
PCB-35	pg/L	5.29	U	U	370		
PCB-36	pg/L	5.29	U	U	21.1		
PCB-37	pg/L	30.5			2960		
PCB-38	pg/L	5.29	U	U	198		
PCB-39	pg/L	5.29	U	U	65.8		
PCB-40	pg/L	52.3			2780		
PCB-41/64/71/72	pg/L	237			11500		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - PCB Congeners

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
PCB-42/59	pg/L	96.8			4750		
PCB-43/49	pg/L	252			12900		
PCB-44	pg/L	296			14500		
PCB-45	pg/L	56.8			3270		
PCB-46	pg/L	24.3			1380		
PCB-47	pg/L	82.9			4160		
PCB-48/75	pg/L	72.1			3230		
PCB-50	pg/L	5.29	U	U	74.2		
PCB-51	pg/L	20.2			1030		
PCB-52/69	pg/L	314			15900		
PCB-53	pg/L	53.8			2790		
PCB-54	pg/L	5.29	U	U	87.5		
PCB-55	pg/L	6.25			205		
PCB-56/60	pg/L	153			6790		
PCB-57	pg/L	5.29	U	U	70.3		
PCB-58	pg/L	5.29	U	U	42.8		
PCB-61/70	pg/L	296			13900		
PCB-62	pg/L	5.29	U	U	4.91	U	U
PCB-63	pg/L	10.3			461		
PCB-65	pg/L	5.29	U	U	15		
PCB-67	pg/L	12.5			546		
PCB-68	pg/L	5.29	U	U	60.4		
PCB-73	pg/L	5.29	U	U	4.91	U	U
PCB-74	pg/L	114			5600		
PCB-76/66	pg/L	205			9770		
PCB-77	pg/L	23.3			816		
PCB-78	pg/L	5.29	U	U	43.3		
PCB-79	pg/L	5.47			143		
PCB-80	pg/L	5.29	U	U	4.91	U	U
PCB-81	pg/L	0.991	U,*	U	33.1		
PCB-82	pg/L	53.2			1470		
PCB-83	pg/L	5.29	U	U	4.91	U	U
PCB-84/92	pg/L	158			4550		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - PCB Congeners

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
PCB-85/116	pg/L	62.7			1790		
PCB-86	pg/L	5.29	U	U	77.1		
PCB-87/117/125	pg/L	116			3370		
PCB-88/91	pg/L	66			1870		
PCB-89	pg/L	8.64			234		
PCB-90/101	pg/L	388			10100		
PCB-93	pg/L	5.29	U	U	4.91	U	U
PCB-94	pg/L	5.29	U	U	107		
PCB-95/98/102	pg/L	308			9150		
PCB-96	pg/L	7.23			162		
PCB-97	pg/L	119			3350		
PCB-99	pg/L	188			4860		
PCB-100	pg/L	5.29	U	U	131		
PCB-103	pg/L	5.29	U	U	140		
PCB-104	pg/L	5.29	U	U	23	U,I	UJ
PCB-105	pg/L	116			2860		
PCB-106/118	pg/L	307			7700		
PCB-107/109	pg/L	24.6			597		
PCB-108/112	pg/L	18.7			512		
PCB-110	pg/L	384			11700		
PCB-111/115	pg/L	7.57			162		
PCB-113	pg/L	5.29	U	U	4.91	U	U
PCB-114	pg/L	9.35			218		
PCB-119	pg/L	9.93			255		
PCB-120	pg/L	5.29	U	U	22.6		
PCB-121	pg/L	5.29	U	U	4.91	U	U
PCB-122	pg/L	5.29	U	U	124		
PCB-123	pg/L	6.48			154		
PCB-124	pg/L	15.2			344		
PCB-126	pg/L	2.53	J	J	38.6		
PCB-127	pg/L	5.29	U	U	4.91	U	U
PCB-128/162	pg/L	81			1260		
PCB-129	pg/L	26.2			393		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - PCB Congeners

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
PCB-130	pg/L	35.2			570		
PCB-131	pg/L	5.29	U	U	4.91	U	U
PCB-132/161	pg/L	134			2480		
PCB-133/142	pg/L	16.6			268		
PCB-134/143	pg/L	26.1			464		
PCB-135	pg/L	48.6			846		
PCB-136	pg/L	63.6			1150		
PCB-137	pg/L	24.9			380		
PCB-138/163/164	pg/L	512			8130		
PCB-139/149	pg/L	288			4980		
PCB-140	pg/L	5.29	U	U	44.1		
PCB-141	pg/L	98.9			1550		
PCB-144	pg/L	18			285		
PCB-145	pg/L	5.29	U	U	4.91	U	U
PCB-146/165	pg/L	75.3			1200		
PCB-147	pg/L	9.11			148		
PCB-148	pg/L	5.29	U	U	17.5		
PCB-150	pg/L	5.29	U	U	26.7		
PCB-151	pg/L	85.8			1500		
PCB-152	pg/L	5.29	U	U	12.7		
PCB-153	pg/L	480			7550		
PCB-154	pg/L	9.81			151		
PCB-155	pg/L	31.9			470		
PCB-156	pg/L	52.6			774		
PCB-157	pg/L	12.6			178		
PCB-158/160	pg/L	56.5			873		
PCB-159	pg/L	5.29	U	U	4.91	U	U
PCB-166	pg/L	5.29	U	U	42.2		
PCB-167	pg/L	23.3			307		
PCB-168	pg/L	5.29	U	U	10.9	U,I	UJ
PCB-169	pg/L	1.88	U,*	U	3.82	U,*	U
PCB-170	pg/L	178			1800		
PCB-171	pg/L	46.6			506		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - PCB Congeners

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
PCB-172	pg/L	30.9			301		
PCB-173	pg/L	5.64			51.5		
PCB-174	pg/L	203			2250		
PCB-175	pg/L	9.95			100		
PCB-176	pg/L	29.4			326		
PCB-177	pg/L	117			1280		
PCB-178	pg/L	44.3			466		
PCB-179	pg/L	101			1140		
PCB-180	pg/L	438			4580		
PCB-181	pg/L	5.29	U	U	13.2		
PCB-182/187	pg/L	268			2850		
PCB-183	pg/L	119			1220		
PCB-184	pg/L	5.29	U	U	32.1		
PCB-185	pg/L	24.7			248		
PCB-186	pg/L	5.29	U	U	4.91	U	U
PCB-188	pg/L	5.29	U	U	6.85		
PCB-189	pg/L	7.97			67.4		
PCB-190	pg/L	36.7			394		
PCB-191	pg/L	6.86			71.4		
PCB-192	pg/L	5.29	U	U	4.91	U	U
PCB-193	pg/L	20.8			211		
PCB-194	pg/L	137			1070		
PCB-195	pg/L	51			411		
PCB-196/203	pg/L	156			1240		
PCB-197	pg/L	5.29	U	U	44.1		
PCB-198	pg/L	6.5	U,I	UJ	57.8		
PCB-199	pg/L	160			1320		
PCB-200	pg/L	20.6			159		
PCB-201	pg/L	22.4			167		
PCB-202	pg/L	43.4			335		
PCB-204	pg/L	5.29	U	U	4.91	U	U
PCB-205	pg/L	8.39			78.3		
PCB-206	pg/L	123			852		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - PCB Congeners

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
PCB-207	pg/L	14.7			105		
PCB-208	pg/L	42.6			287		
PCB-209	pg/L	172			3450		
Total monoCB	pg/L	5.29	U	U	6280		
Total diCB	pg/L	98.7			40400		
Total triCB	pg/L	1110			123000		J
Total tetraCB	pg/L	2390			117000		
Total pentaCB	pg/L	2380			66000		
Total hexaCB	pg/L	2210			36000		
Total heptaCB	pg/L	1690			17900		
Total octaCB	pg/L	599			4880		
Total nonaCB	pg/L	180			1240		
Total decaCB	pg/L	172			3450		
Total PCB	pg/L	10800			416000		J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1168 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-03	LQ	VQ	PRR1WATCMI-03	LQ	VQ
2,3,7,8-TCDD	pg/L	95.5			4130	E	EJ
1,2,3,7,8-PeCDD	pg/L	1.03	U	U	5.18	J	J
1,2,3,4,7,8-HxCDD	pg/L	1.65	U	U	1.75	U	U
1,2,3,6,7,8-HxCDD	pg/L	2.05	U	U	14.2	J	J
1,2,3,7,8,9-HxCDD	pg/L	2.11	U	U	4.49	J	J
1,2,3,4,6,7,8-HpCDD	pg/L	18.7	J	J	304		
OCDD	pg/L	146			2890		
Total TCDD	pg/L	95.5			4440		
Total PeCDD	pg/L	1.03	U	U	27.3		
Total HxCDD	pg/L	7.21			77.1		
Total HpCDD	pg/L	42.5			532		
2,3,7,8-TCDF	pg/L	1.09	U	U	8		
1,2,3,7,8-PeCDF	pg/L	0.973	U	U	4.98	EMPC	EMPC
2,3,4,7,8-PeCDF	pg/L	0.972	U	U	8.52	J	J
1,2,3,4,7,8-HxCDF	pg/L	4.83	J	J	103		
1,2,3,6,7,8-HxCDF	pg/L	0.789	U	U	19.6	J	J
1,2,3,7,8,9-HxCDF	pg/L	1.21	U	U	1.78	J	J
2,3,4,6,7,8-HxCDF	pg/L	0.778	U	U	11.4	J	J
1,2,3,4,6,7,8-HpCDF	pg/L	21.2	J	J	469		
1,2,3,4,7,8,9-HpCDF	pg/L	2.68	U	U	20.6	J	J
OCDF	pg/L	64.2			2280		
Total TCDF	pg/L	14.9			870		
Total PeCDF	pg/L	17.6			566		
Total HxCDF	pg/L	17.3			531		
Total HpCDF	pg/L	32.7			733		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	97.6			4160		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1WATCME-03 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33662-001	Date Received:	22-Mar-12
Project:	PRR1168	Sample Size:	0.914 L	QC Batch No.:	4330	Date Extracted:	22-Mar-12
Date Collected:	21-Mar-12			Date Analyzed DB-5:	23-Mar-12	Date Analyzed DB-225:	NA
Time Collected:	1030						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	95.5			
1,2,3,7,8-PeCDD	ND	1.03		
1,2,3,4,7,8-HxCDD	ND	1.65		
1,2,3,6,7,8-HxCDD	ND	2.05		
1,2,3,7,8,9-HxCDD	ND	2.11		
1,2,3,4,6,7,8-HpCDD	18.7			J
OCDD	146			
2,3,7,8-TCDF	ND	1.09		
1,2,3,7,8-PeCDF	ND	0.973		
2,3,4,7,8-PeCDF	ND	0.972		
1,2,3,4,7,8-HxCDF	4.83			J
1,2,3,6,7,8-HxCDF	ND	0.789		
2,3,4,6,7,8-HxCDF	ND	0.778		
1,2,3,7,8,9-HxCDF	ND	1.21		
1,2,3,4,6,7,8-HpCDF	21.2			J
1,2,3,4,7,8,9-HpCDF	ND	2.68		
OCDF	64.2			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	76.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	83.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	81.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	74.7	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	76.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	76.9	23 - 140	
	13C-OCDD	70.1	17 - 157	
	13C-2,3,7,8-TCDF	76.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	77.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	78.6	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	80.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	75.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	80.9	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	74.6	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	79.8	26 - 138	
	13C-OCDF	71.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	106	35 - 197	

Totals			
Total TCDD	95.5		99.3
Total PeCDD	ND	1.03	
Total HxCDD	7.21		
Total HpCDD	42.5		
Total TCDF	14.9		16.8
Total PeCDF	17.6		18.9
Total HxCDF	17.3		22.2
Total HpCDF	32.7		

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 96.4

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Martha M. Maier 26-Mar-2012 15:12

Sample ID: PRR1WATCMI-03

EPA Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33662-002	Date Received:	22-Mar-12
Project:	PRR1168	Sample Size:	1.05 L	QC Batch No.:	4330	Date Extracted:	22-Mar-12
Date Collected:	21-Mar-12			Date Analyzed DB-5:	23-Mar-12	Dates Analyzed DB-225:	24-Mar-12
Time Collected:	1030						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	4130			E J
1,2,3,7,8-PeCDD	5.18			J
1,2,3,4,7,8-HxCDD	ND	1.75		
1,2,3,6,7,8-HxCDD	14.2			J
1,2,3,7,8,9-HxCDD	4.49			J
1,2,3,4,6,7,8-HpCDD	304			
OCDD	2890			
2,3,7,8-TCDF	8.00			
1,2,3,7,8-PeCDF	ND		4.98	
2,3,4,7,8-PeCDF	8.52			J
1,2,3,4,7,8-HxCDF	103			
1,2,3,6,7,8-HxCDF	19.6			J
2,3,4,6,7,8-HxCDF	11.4			J
1,2,3,7,8,9-HxCDF	1.78			J
1,2,3,4,6,7,8-HpCDF	469			
1,2,3,4,7,8,9-HpCDF	20.6			J
OCDF	2280			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	86.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	90.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	75.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	77.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	72.9	23 - 140	
	13C-OCDD	65.1	17 - 157	
	13C-2,3,7,8-TCDF	86.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	84.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	84.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	87.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	80.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	74.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	77.6	26 - 138	
	13C-OCDF	66.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	109	35 - 197	

Totals		
Total TCDD	4440	
Total PeCDD	27.3	37.6
Total HxCDD	77.1	
Total HpCDD	532	
Total TCDF	870	879
Total PeCDF	566	571
Total HxCDF	531	
Total HpCDF	733	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 4160

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Martha M. Maier 26-Mar-2012 15:12

Sample ID:	PRR1WATCME-03			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33662-001	Date Received: 22-Mar-12
Project:	PRR1168	Sample Size: 0.946 L	QC Batch No.: 4329	Date Extracted: 22-Mar-12
Date Collected:	21-Mar-12	%Solids: 1.05	Date Analyzed DB-1 23-Mar-12	
Time Collected:	1030			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	ND	5.29	
PCB-2	ND	5.29	
PCB-3	ND	5.29	
PCB-4/10	19.1	10.6	
PCB-5/8	39.3	10.6	
PCB-6	13.3	10.6	
PCB-7/9	ND	10.6	
PCB-11	26.9	10.6	
PCB-12/13	ND	10.6	
PCB-14	ND	10.6	
PCB-15	ND	10.6	
PCB-16/32	116	5.29	
PCB-17	83.5	5.29	
PCB-18	187	5.29	
PCB-19	19.9	5.29	
PCB-20/21/33	114	5.29	
PCB-22	75.9	5.29	
PCB-23	ND	5.29	
PCB-24/27	15.3	5.29	
PCB-25	28.2	5.29	
PCB-26	35.6	5.29	
PCB-28	191	5.29	
PCB-29	ND	5.29	
PCB-30	ND	5.29	
PCB-31	213	5.29	
PCB-34	1.96	5.29	J
PCB-35	ND	5.29	
PCB-36	ND	5.29	
PCB-37	30.5	5.29	
PCB-38	ND	5.29	
PCB-39	ND	5.29	
PCB-40	52.3	5.29	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	237	5.29	
PCB-42/59	96.8	5.29	
PCB-43/49	252	5.29	
PCB-44	296	5.29	
PCB-45	56.8	5.29	
PCB-46	24.3	5.29	
PCB-47	82.9	5.29	
PCB-48/75	72.1	5.29	
PCB-50	ND	5.29	
PCB-51	20.2	5.29	
PCB-52/69	314	5.29	
PCB-53	53.8	5.29	
PCB-54	ND	5.29	
PCB-55	6.25	5.29	
PCB-56/60	153	5.29	
PCB-57	ND	5.29	
PCB-58	ND	5.29	
PCB-61/70	296	5.29	
PCB-62	ND	5.29	
PCB-63	10.3	5.29	
PCB-65	ND	5.29	
PCB-67	12.5	5.29	
PCB-68	ND	5.29	
PCB-73	ND	5.29	
PCB-74	114	5.29	
PCB-76/66	205	5.29	
PCB-77	23.3	5.29	
PCB-78	ND	5.29	
PCB-79	5.47	5.29	
PCB-80	ND	5.29	
PCB-81	ND	0.991	
PCB-82	53.2	5.29	

Sample ID:	PRR1WATCME-03			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33662-001	Date Received: 22-Mar-12
Project:	PRR1168	Sample Size: 0.946 L	QC Batch No.: 4329	Date Extracted: 22-Mar-12
Date Collected:	21-Mar-12	%Solids: 1.05	Date Analyzed DB-1 23-Mar-12	
Time Collected:	1030			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	5.29		PCB-127	ND	5.29	
PCB-84/92	158	5.29		PCB-128/162	81.0	5.29	
PCB-85/116	62.7	5.29		PCB-129	26.2	5.29	
PCB-86	ND	5.29		PCB-130	35.2	5.29	
PCB-87/117/125	116	5.29		PCB-131	ND	5.29	
PCB-88/91	66.0	5.29		PCB-132/161	134	5.29	
PCB-89	8.64	5.29		PCB-133/142	16.6	5.29	
PCB-90/101	388	5.29		PCB-134/143	26.1	5.29	
PCB-93	ND	5.29		PCB-135	48.6	5.29	
PCB-94	ND	5.29		PCB-136	63.6	5.29	
PCB-95/98/102	308	5.29		PCB-137	24.9	5.29	
PCB-96	7.23	5.29		PCB-138/163/164	512	5.29	
PCB-97	119	5.29		PCB-139/149	288	5.29	
PCB-99	188	5.29		PCB-140	ND	5.29	
PCB-100	ND	5.29		PCB-141	98.9	5.29	
PCB-103	ND	5.29		PCB-144	18.0	5.29	
PCB-104	ND	5.29		PCB-145	ND	5.29	
PCB-105	116	5.29		PCB-146/165	75.3	5.29	
PCB-106/118	307	5.29		PCB-147	9.11	5.29	
PCB-107/109	24.6	5.29		PCB-148	ND	5.29	
PCB-108/112	18.7	5.29		PCB-150	ND	5.29	
PCB-110	384	5.29		PCB-151	85.8	5.29	
PCB-111/115	7.57	5.29		PCB-152	ND	5.29	
PCB-113	ND	5.29		PCB-153	480	5.29	
PCB-114	9.35	5.29		PCB-154	9.81	5.29	
PCB-119	9.93	5.29		PCB-155	31.9	5.29	
PCB-120	ND	5.29		PCB-156	52.6	5.29	
PCB-121	ND	5.29		PCB-157	12.6	5.29	
PCB-122	ND	5.29		PCB-158/160	56.5	5.29	
PCB-123	6.48	5.29		PCB-159	ND	5.29	
PCB-124	15.2	5.29		PCB-166	ND	5.29	
PCB-126	2.53	5.29	J	PCB-167	23.3	5.29	

Sample ID:	PRR1WATCME-03			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33662-001	Date Received: 22-Mar-12
Project:	PRR1168	Sample Size: 0.946 L	QC Batch No.: 4329	Date Extracted: 22-Mar-12
Date Collected:	21-Mar-12	%Solids: 1.05	Date Analyzed DB-1 23-Mar-12	
Time Collected:	1030			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	5.29	
PCB-169	ND	1.88	
PCB-170	178	5.29	
PCB-171	46.6	5.29	
PCB-172	30.9	5.29	
PCB-173	5.64	5.29	
PCB-174	203	5.29	
PCB-175	9.95	5.29	
PCB-176	29.4	5.29	
PCB-177	117	5.29	
PCB-178	44.3	5.29	
PCB-179	101	5.29	
PCB-180	438	5.29	
PCB-181	ND	5.29	
PCB-182/187	268	5.29	
PCB-183	119	5.29	
PCB-184	ND	5.29	
PCB-185	24.7	5.29	
PCB-186	ND	5.29	
PCB-188	ND	5.29	
PCB-189	7.97	5.29	
PCB-190	36.7	5.29	
PCB-191	6.86	5.29	
PCB-192	ND	5.29	
PCB-193	20.8	5.29	
PCB-194	137	5.29	
PCB-195	51.0	5.29	
PCB-196/203	156	5.29	
PCB-197	ND	5.29	
PCB-198	ND	6.50	J
PCB-199	160	5.29	
PCB-200	20.6	5.29	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	22.4	5.29	
PCB-202	43.4	5.29	
PCB-204	ND	5.29	
PCB-205	8.39	5.29	
PCB-206	123	5.29	
PCB-207	14.7	5.29	
PCB-208	42.6	5.29	
PCB-209	172	5.29	
Total monoCB	ND	5.29	
Total diCB	98.7	10.6	
Total triCB	1110	5.29	
Total tetraCB	2390	5.29	
Total pentaCB	2380	5.29	
Total hexaCB	2210	5.29	
Total heptaCB	1690	5.29	
Total octaCB	599	5.29	
Total nonaCB	180	5.29	
Total decaCB	172	5.29	
Total PCB	10800	10.6	

TEQ(WHO-2005 Mammal [(Min)]: **0.271**

Sample ID:	PRR1WATCMI-03			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33662-002	Date Received: 22-Mar-12
Project:	PRR1168	Sample Size: 1.02 L	QC Batch No.: 4329	Date Extracted: 22-Mar-12
Date Collected:	21-Mar-12	%Solids: 1.00	Date Analyzed DB-1 23-Mar-12	
Time Collected:	1030			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	4510	4.91	
PCB-2	944	4.91	
PCB-3	828	4.91	
PCB-4/10	9700	9.82	
PCB-5/8	15300	9.82	
PCB-6	5170	9.82	
PCB-7/9	2170	9.82	
PCB-11	3670	9.82	
PCB-12/13	1610	9.82	
PCB-14	244	9.82	
PCB-15	2540	9.82	
PCB-16/32	13700	4.91	
PCB-17	10200	4.91	
PCB-18	24200	4.91	E J
PCB-19	2560	4.91	
PCB-20/21/33	13300	4.91	
PCB-22	8830	4.91	
PCB-23	45.6	4.91	
PCB-24/27	1750	4.91	
PCB-25	3060	4.91	
PCB-26	3410	4.91	
PCB-28	19700	4.91	
PCB-29	168	4.91	
PCB-30	27.0	4.91	
PCB-31	18000	4.91	
PCB-34	188	4.91	
PCB-35	370	4.91	
PCB-36	21.1	4.91	
PCB-37	2960	4.91	
PCB-38	198	4.91	
PCB-39	65.8	4.91	
PCB-40	2780	4.91	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	11500	4.91	
PCB-42/59	4750	4.91	
PCB-43/49	12900	4.91	
PCB-44	14500	4.91	
PCB-45	3270	4.91	
PCB-46	1380	4.91	
PCB-47	4160	4.91	
PCB-48/75	3230	4.91	
PCB-50	74.2	4.91	
PCB-51	1030	4.91	
PCB-52/69	15900	4.91	
PCB-53	2790	4.91	
PCB-54	87.5	4.91	
PCB-55	205	4.91	
PCB-56/60	6790	4.91	
PCB-57	70.3	4.91	
PCB-58	42.8	4.91	
PCB-61/70	13900	4.91	
PCB-62	ND	4.91	
PCB-63	461	4.91	
PCB-65	15.0	4.91	
PCB-67	546	4.91	
PCB-68	60.4	4.91	
PCB-73	ND	4.91	
PCB-74	5600	4.91	
PCB-76/66	9770	4.91	
PCB-77	816	4.91	
PCB-78	43.3	4.91	
PCB-79	143	4.91	
PCB-80	ND	4.91	
PCB-81	33.1	4.91	
PCB-82	1470	4.91	

Sample ID:	PRR1WATCMI-03			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33662-002	Date Received: 22-Mar-12
Project:	PRR1168	Sample Size: 1.02 L	QC Batch No.: 4329	Date Extracted: 22-Mar-12
Date Collected:	21-Mar-12	%Solids: 1.00	Date Analyzed DB-1 23-Mar-12	
Time Collected:	1030			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.91	
PCB-84/92	4550	4.91	
PCB-85/116	1790	4.91	
PCB-86	77.1	4.91	
PCB-87/117/125	3370	4.91	
PCB-88/91	1870	4.91	
PCB-89	234	4.91	
PCB-90/101	10100	4.91	
PCB-93	ND	4.91	
PCB-94	107	4.91	
PCB-95/98/102	9150	4.91	
PCB-96	162	4.91	
PCB-97	3350	4.91	
PCB-99	4860	4.91	
PCB-100	131	4.91	
PCB-103	140	4.91	
PCB-104	ND	23.0	~~I~~ J
PCB-105	2860	4.91	
PCB-106/118	7700	4.91	
PCB-107/109	597	4.91	
PCB-108/112	512	4.91	
PCB-110	11700	4.91	
PCB-111/115	162	4.91	
PCB-113	ND	4.91	
PCB-114	218	4.91	
PCB-119	255	4.91	
PCB-120	22.6	4.91	
PCB-121	ND	4.91	
PCB-122	124	4.91	
PCB-123	154	4.91	
PCB-124	344	4.91	
PCB-126	38.6	4.91	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	4.91	
PCB-128/162	1260	4.91	
PCB-129	393	4.91	
PCB-130	570	4.91	
PCB-131	ND	4.91	
PCB-132/161	2480	4.91	
PCB-133/142	268	4.91	
PCB-134/143	464	4.91	
PCB-135	846	4.91	
PCB-136	1150	4.91	
PCB-137	380	4.91	
PCB-138/163/164	8130	4.91	
PCB-139/149	4980	4.91	
PCB-140	44.1	4.91	
PCB-141	1550	4.91	
PCB-144	285	4.91	
PCB-145	ND	4.91	
PCB-146/165	1200	4.91	
PCB-147	148	4.91	
PCB-148	17.5	4.91	
PCB-150	26.7	4.91	
PCB-151	1500	4.91	
PCB-152	12.7	4.91	
PCB-153	7550	4.91	
PCB-154	151	4.91	
PCB-155	470	4.91	
PCB-156	774	4.91	
PCB-157	178	4.91	
PCB-158/160	873	4.91	
PCB-159	ND	4.91	
PCB-166	42.2	4.91	
PCB-167	307	4.91	

Sample ID:	PRR1WATCMI-03			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33662-002	Date Received: 22-Mar-12
Project:	PRR1168	Sample Size: 1.02 L	QC Batch No.: 4329	Date Extracted: 22-Mar-12
Date Collected:	21-Mar-12	%Solids: 1.00	Date Analyzed DB-1 23-Mar-12	
Time Collected:	1030			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	10.9	~~J~~ J
PCB-169	ND	3.82	~~J~~
PCB-170	1800	4.91	
PCB-171	506	4.91	
PCB-172	301	4.91	
PCB-173	51.5	4.91	
PCB-174	2250	4.91	
PCB-175	100	4.91	
PCB-176	326	4.91	
PCB-177	1280	4.91	
PCB-178	466	4.91	
PCB-179	1140	4.91	
PCB-180	4580	4.91	
PCB-181	13.2	4.91	
PCB-182/187	2850	4.91	
PCB-183	1220	4.91	
PCB-184	32.1	4.91	
PCB-185	248	4.91	
PCB-186	ND	4.91	
PCB-188	6.85	4.91	
PCB-189	67.4	4.91	
PCB-190	394	4.91	
PCB-191	71.4	4.91	
PCB-192	ND	4.91	
PCB-193	211	4.91	
PCB-194	1070	4.91	
PCB-195	411	4.91	
PCB-196/203	1240	4.91	
PCB-197	44.1	4.91	
PCB-198	57.8	4.91	
PCB-199	1320	4.91	
PCB-200	159	4.91	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	167	4.91	
PCB-202	335	4.91	
PCB-204	ND	4.91	
PCB-205	78.3	4.91	
PCB-206	852	4.91	
PCB-207	105	4.91	
PCB-208	287	4.91	
PCB-209	3450	4.91	
Total monoCB	6280	4.91	
Total diCB	40400	9.82	
Total triCB	123000	4.91	J
Total tetraCB	117000	4.91	
Total pentaCB	66000	4.91	
Total hexaCB	36000	4.91	
Total heptaCB	17900	4.91	
Total octaCB	4880	4.91	
Total nonaCB	1240	4.91	
Total decaCB	3450	4.91	
Total PCB	416000	9.82	J

TEQ(WHO-2005 Mammal [(Min)]: **4.32**

ARCADIS
Infrastructure, environment, buildings
ARCADIS
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Syracuse, NY 13214
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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33662 4.7°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1168	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-03	3/21/2012	10:30	water	Grab	4	X	X																
PRR1WATCMI-03	3/21/2012	10:40	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to QAPP WS 15-4 for Effluent Sample Analyses and WS15-5 for Influent Sample Analyses
X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista (El Dorado Hills, CA)

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	3/21/2012	1400				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
				3/22/12 0802		
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1177 (33674)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17155R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1177 (33674) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1WATCME-09	200-10092-1	Water	3/28/2012				X		X
PRR1WATCMI-09	200-10092-2	Water	3/28/2012				X		X

1. PCDD/PCDF by EPA Method 1613.
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was not detected in the samples so confirmation analyses were not performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited concentrations greater than the RL for many congeners. The sample concentrations were greater than five times the method blank concentration with the exception of PCB-126; this congener's concentration was less than five times that of the method blank. See Section 2.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

The method blanks exhibited concentrations greater than the RL for many of the PCB congeners. The sample concentrations were greater than five times the method blank concentration for most congeners. Therefore, detected sample results were not associated with laboratory contamination and resulted in the removal of the laboratory qualifier (B). The sample results for PCB-126 are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-09	PCB-18	29300 E	--	29300 EJ

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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory added the qualifier "I" which is defined by the laboratory as "Chemical Interference." These samples results were qualified as estimated (J).

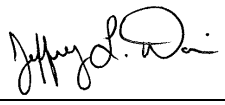
The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: August 31, 2012

PEER REVIEW: Dennis Capria

DATE: October 3, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - PCB Congeners

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
PCB-1	pg/L	4.9	U	U	3490		
PCB-2	pg/L	4.9	U	U	302		
PCB-3	pg/L	4.9	U	U	362		
PCB-4/10	pg/L	15.4			9360		
PCB-5/8	pg/L	32			14500		
PCB-6	pg/L	11			5360		
PCB-7/9	pg/L	9.8	U	U	1880		
PCB-11	pg/L	30.9			4310		
PCB-12/13	pg/L	9.8	U	U	1430		
PCB-14	pg/L	9.8	U	U	65.7		
PCB-15	pg/L	9.8	U	U	2180		
PCB-16/32	pg/L	98.1			16900		
PCB-17	pg/L	69.9			12700		
PCB-18	pg/L	150			29300	E	EJ
PCB-19	pg/L	16.5			2930		
PCB-20/21/33	pg/L	88.8			14100		
PCB-22	pg/L	52.7			8570		
PCB-23	pg/L	4.9	U	U	30.8		
PCB-24/27	pg/L	11.5			1980		
PCB-25	pg/L	23.3			3810		
PCB-26	pg/L	27.2			4230		
PCB-28	pg/L	123			22800		
PCB-29	pg/L	4.9	U	U	161		
PCB-30	pg/L	4.9	U	U	26.5		
PCB-31	pg/L	191			20900		
PCB-34	pg/L	4.9	U	U	229		
PCB-35	pg/L	4.9	U	U	385		
PCB-36	pg/L	4.9	U	U	5.01	U	U
PCB-37	pg/L	20.6			3570		
PCB-38	pg/L	4.9	U	U	398		
PCB-39	pg/L	4.9	U	U	5.01	U	U
PCB-40	pg/L	46.4			3440		
PCB-41/64/71/72	pg/L	204			14700		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - PCB Congeners

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
PCB-42/59	pg/L	86.2			6150		
PCB-43/49	pg/L	221			16900		
PCB-44	pg/L	261			19400		
PCB-45	pg/L	42.7			3630		
PCB-46	pg/L	21.8			1630		
PCB-47	pg/L	80.3			5610		
PCB-48/75	pg/L	61			4320		
PCB-50	pg/L	4.9	U	U	89.3		
PCB-51	pg/L	19.5			1450		
PCB-52/69	pg/L	277			20400		
PCB-53	pg/L	45.5			3480		
PCB-54	pg/L	4.9	U	U	138		
PCB-55	pg/L	4.9	U	U	271		
PCB-56/60	pg/L	137			9450		
PCB-57	pg/L	4.9	U	U	98.1		
PCB-58	pg/L	4.9	U	U	60.3		
PCB-61/70	pg/L	265			18100		
PCB-62	pg/L	4.9	U	U	5.01	U	U
PCB-63	pg/L	9.37			674		
PCB-65	pg/L	4.9	U	U	12.4		
PCB-67	pg/L	10.1			740		
PCB-68	pg/L	4.9	U	U	67.8		
PCB-73	pg/L	4.9	U	U	5.01	U	U
PCB-74	pg/L	98.2			7310		
PCB-76/66	pg/L	179			13400		
PCB-77	pg/L	23.2	B		1100	B	
PCB-78	pg/L	4.9	U	U	5.01	U	U
PCB-79	pg/L	5.59			218		
PCB-80	pg/L	4.9	U	U	5.01	U	U
PCB-81	pg/L	0.701	J	J	76		
PCB-82	pg/L	46.9			2150		
PCB-83	pg/L	4.9	U	U	12		
PCB-84/92	pg/L	138			7060		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - PCB Congeners

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
PCB-85/116	pg/L	57.6			2570		
PCB-86	pg/L	4.9	U	U	142		
PCB-87/117/125	pg/L	99.5			4980		
PCB-88/91	pg/L	55.3			2890		
PCB-89	pg/L	6.9	U,I	UJ	354		
PCB-90/101	pg/L	326			16300		
PCB-93	pg/L	4.9	U	U	5.01	U	U
PCB-94	pg/L	4.9	U	U	168		
PCB-95/98/102	pg/L	259			13300		
PCB-96	pg/L	5.36			176		
PCB-97	pg/L	99.6			5080		
PCB-99	pg/L	162			8020		
PCB-100	pg/L	4.98			366		
PCB-103	pg/L	4.9	U	U	246		
PCB-104	pg/L	4.9	U	U	52.8	U,I	UJ
PCB-105	pg/L	91.7			3760		
PCB-106/118	pg/L	259	B		11400	B	
PCB-107/109	pg/L	21.3			890		
PCB-108/112	pg/L	16.2			775		
PCB-110	pg/L	367			17300		
PCB-111/115	pg/L	6.59			307		
PCB-113	pg/L	4.9	U	U	5.01	U	U
PCB-114	pg/L	6.52			288		
PCB-119	pg/L	8.59			445		
PCB-120	pg/L	4.9	U	U	62.6		
PCB-121	pg/L	4.9	U	U	5.01	U	U
PCB-122	pg/L	4.9	U	U	163		
PCB-123	pg/L	5.37			221		
PCB-124	pg/L	11.9			503		
PCB-126	pg/L	4.9	J,B	UB	56.2	B	
PCB-127	pg/L	4.9	U	U	5.01	U	U
PCB-128/162	pg/L	63.6			1730		
PCB-129	pg/L	20.6			551		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - PCB Congeners

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
PCB-130	pg/L	28.8			784		
PCB-131	pg/L	4.9	U	U	5.01	U	U
PCB-132/161	pg/L	117			3530		
PCB-133/142	pg/L	13.8			421		
PCB-134/143	pg/L	21.3			664		
PCB-135	pg/L	40.6			1330		
PCB-136	pg/L	55.5			1810		
PCB-137	pg/L	25.1			561		
PCB-138/163/164	pg/L	418			12100		
PCB-139/149	pg/L	257			7790		
PCB-140	pg/L	4.9	U	U	88.5		
PCB-141	pg/L	83.1			2280		
PCB-144	pg/L	16			420		
PCB-145	pg/L	4.9	U	U	5.28		
PCB-146/165	pg/L	68.1			2050		
PCB-147	pg/L	9.01			310		
PCB-148	pg/L	4.9	U	U	43.1		
PCB-150	pg/L	4.9	U	U	65.8		
PCB-151	pg/L	75.4			2310		
PCB-152	pg/L	4.9	U	U	19.8		
PCB-153	pg/L	439			12000		
PCB-154	pg/L	11.4			383		
PCB-155	pg/L	21.9			1710		
PCB-156	pg/L	43.1			1080		
PCB-157	pg/L	10.2			237		
PCB-158/160	pg/L	43.5			1260		
PCB-159	pg/L	8.59			5.01	U	U
PCB-166	pg/L	4.9	U	U	47.7		
PCB-167	pg/L	17.6			450		
PCB-168	pg/L	4.9	U	U	25.7		
PCB-169	pg/L	2.08	U,*	U	5.01	J,B	UB
PCB-170	pg/L	138			2800		
PCB-171	pg/L	37.8			789		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - PCB Congeners

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
PCB-172	pg/L	22.6			473		
PCB-173	pg/L	4.9	U	U	77.3		
PCB-174	pg/L	162			3500		
PCB-175	pg/L	7.38			151		
PCB-176	pg/L	23.4			526		
PCB-177	pg/L	95.5			2050		
PCB-178	pg/L	34.5			805		
PCB-179	pg/L	82.7			1840		
PCB-180	pg/L	445			7380		
PCB-181	pg/L	4.9	U	U	5.01	U	U
PCB-182/187	pg/L	218			4990		
PCB-183	pg/L	97.3			2020		
PCB-184	pg/L	4.9	U	U	57		
PCB-185	pg/L	17.3			386		
PCB-186	pg/L	4.9	U	U	5.01	U	U
PCB-188	pg/L	4.9	U	U	20.8		
PCB-189	pg/L	5.94	B		100	B	
PCB-190	pg/L	26.9			552		
PCB-191	pg/L	5.84			109		
PCB-192	pg/L	4.9	U	U	5.01	U	U
PCB-193	pg/L	15.8			343		
PCB-194	pg/L	102			1450		
PCB-195	pg/L	39.4			595		
PCB-196/203	pg/L	131			1910		
PCB-197	pg/L	4.9	U	U	71.2		
PCB-198	pg/L	5.49			94.6		
PCB-199	pg/L	124			2000		
PCB-200	pg/L	15.4			245		
PCB-201	pg/L	17.2			273		
PCB-202	pg/L	29.3			470		
PCB-204	pg/L	4.9	U	U	5.01	U	U
PCB-205	pg/L	6.35			63.9		
PCB-206	pg/L	73.7			942		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - PCB Congeners

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
PCB-207	pg/L	8.71			110		
PCB-208	pg/L	22.1			273		
PCB-209	pg/L	50.3			758		
Total monoCB	pg/L	4.9	U	U	4150		
Total diCB	pg/L	89.3			39000		
Total triCB	pg/L	872			143000		J
Total tetraCB	pg/L	2090	B		153000	B	
Total pentaCB	pg/L	2050	B		100000	B	
Total hexaCB	pg/L	1910	B		56000	B	
Total heptaCB	pg/L	1440	B		29000	B	
Total octaCB	pg/L	470			7180		
Total nonaCB	pg/L	104			1320		
Total decaCB	pg/L	50.3			758		
Total PCB	pg/L	9070	B		534000	B	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1177 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-09	LQ	VQ	PRR1WATCMI-09	LQ	VQ
2,3,7,8-TCDD	pg/L	11.4			592		
1,2,3,7,8-PeCDD	pg/L	1.74	U	U	3.56	J	J
1,2,3,4,7,8-HxCDD	pg/L	2.09	U	U	3.25	U	U
1,2,3,6,7,8-HxCDD	pg/L	2.45	U	U	11.5	J	J
1,2,3,7,8,9-HxCDD	pg/L	2.43	U	U	3.86	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	5.04	J	J	153		
OCDD	pg/L	57.7			2030		
Total TCDD	pg/L	11.4			637		
Total PeCDD	pg/L	1.74	U	U	18.3		
Total HxCDD	pg/L	2.45	U	U	56.7		
Total HpCDD	pg/L	11.1			321		
2,3,7,8-TCDF	pg/L	0.991	U	U	3.59	EMPC	EMPC
1,2,3,7,8-PeCDF	pg/L	1.01	U	U	4.44	J	J
2,3,4,7,8-PeCDF	pg/L	0.962	U	U	16.8	J	J
1,2,3,4,7,8-HxCDF	pg/L	2.91	J	J	71.2		
1,2,3,6,7,8-HxCDF	pg/L	1.19	U	U	13.6	J	J
1,2,3,7,8,9-HxCDF	pg/L	1.91	U	U	3.2	U	U
2,3,4,6,7,8-HxCDF	pg/L	1.36	U	U	9.2	J	J
1,2,3,4,6,7,8-HpCDF	pg/L	8.85	J	J	258		
1,2,3,4,7,8,9-HpCDF	pg/L	2.78	U	U	10.4	EMPC	EMPC
OCDF	pg/L	15.1	J	J	580		
Total TCDF	pg/L	0.991	U	U	304		
Total PeCDF	pg/L	2.15			249		
Total HxCDF	pg/L	2.91			239		
Total HpCDF	pg/L	12			336		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	13.5			617		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1WATCME-09 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33674-001	Date Received:	29-Mar-12
Project:	PRR1177	Sample Size:	0.990 L	QC Batch No.:	4344	Date Extracted:	29-Mar-12
Date Collected:	28-Mar-12			Date Analyzed DB-5:	30-Mar-12	Date Analyzed DB-225:	NA
Time Collected:	1145						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	11.4			
1,2,3,7,8-PeCDD	ND	1.74		
1,2,3,4,7,8-HxCDD	ND	2.09		
1,2,3,6,7,8-HxCDD	ND	2.45		
1,2,3,7,8,9-HxCDD	ND	2.43		
1,2,3,4,6,7,8-HpCDD	5.04			J
OCDD	57.7			
2,3,7,8-TCDF	ND	0.991		
1,2,3,7,8-PeCDF	ND	1.01		
2,3,4,7,8-PeCDF	ND	0.962		
1,2,3,4,7,8-HxCDF	2.91			J
1,2,3,6,7,8-HxCDF	ND	1.19		
2,3,4,6,7,8-HxCDF	ND	1.36		
1,2,3,7,8,9-HxCDF	ND	1.91		
1,2,3,4,6,7,8-HpCDF	8.85			J
1,2,3,4,7,8,9-HpCDF	ND	2.78		
OCDF	15.1			J

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	83.5	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	70.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	63.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	66.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	62.1	23 - 140	
	13C-OCDD	53.9	17 - 157	
	13C-2,3,7,8-TCDF	80.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	82.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	83.5	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	80.7	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	67.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	70.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	70.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	66.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	66.4	26 - 138	
	13C-OCDF	55.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	102	35 - 197	

Totals

Total TCDD	11.4			
Total PeCDD	ND	1.74		
Total HxCDD	ND	2.45		
Total HpCDD	11.1			
Total TCDF	ND	0.991		
Total PeCDF	2.15		3.84	
Total HxCDF	2.91		4.97	
Total HpCDF	12.0			

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 11.9

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 02-Apr-2012 12:57

Sample ID: PRR1WATCMI-09 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33674-002	Date Received:	29-Mar-12
Project:	PRR1177	Sample Size:	0.970 L	QC Batch No.:	4344	Date Extracted:	29-Mar-12
Date Collected:	28-Mar-12			Date Analyzed DB-5:	30-Mar-12	Date Analyzed DB-225:	NA
Time Collected:	1205						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	592			
1,2,3,7,8-PeCDD	3.56			J
1,2,3,4,7,8-HxCDD	ND	3.25		
1,2,3,6,7,8-HxCDD	11.5			J
1,2,3,7,8,9-HxCDD	ND	3.86		
1,2,3,4,6,7,8-HpCDD	153			
OCDD	2030			
2,3,7,8-TCDF	ND		3.59	
1,2,3,7,8-PeCDF	4.44			J
2,3,4,7,8-PeCDF	16.8			J
1,2,3,4,7,8-HxCDF	71.2			
1,2,3,6,7,8-HxCDF	13.6			J
2,3,4,6,7,8-HxCDF	9.20			J
1,2,3,7,8,9-HxCDF	ND	3.20		
1,2,3,4,6,7,8-HpCDF	258			
1,2,3,4,7,8,9-HpCDF	ND		10.4	
OCDF	580			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	83.9	25 - 164	
	13C-1,2,3,7,8-PeCDD	85.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	71.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	65.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	69.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	65.1	23 - 140	
	13C-OCDD	56.2	17 - 157	
	13C-2,3,7,8-TCDF	81.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	85.5	24 - 185	
	13C-2,3,4,7,8-PeCDF	86.2	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	84.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	74.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	72.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	72.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	69.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	69.0	26 - 138	
	13C-OCDF	59.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	98.8	35 - 197	

Totals	
Total TCDD	637
Total PeCDD	18.3
Total HxCDD	56.7
Total HpCDD	321
Total TCDF	304
Total PeCDF	249
Total HxCDF	239
Total HpCDF	336

	20.8
	63.1
	313
	251
	346

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 616

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 02-Apr-2012 12:57

Sample ID:	PRR1WATCME-09			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33674-001	Date Received: 29-Mar-12
Project:	PRR1177	Sample Size: 1.02 L	QC Batch No.: 4345	Date Extracted: 29-Mar-12
Date Collected:	28-Mar-12	%Solids: 1.11	Date Analyzed DB-1 30-Mar-12	
Time Collected:	1145			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	ND	4.90		PCB-41/64/71/72	204	4.90	
PCB-2	ND	4.90		PCB-42/59	86.2	4.90	
PCB-3	ND	4.90		PCB-43/49	221	4.90	
PCB-4/10	15.4	9.80		PCB-44	261	4.90	
PCB-5/8	32.0	9.80		PCB-45	42.7	4.90	
PCB-6	11.0	9.80		PCB-46	21.8	4.90	
PCB-7/9	ND	9.80		PCB-47	80.3	4.90	
PCB-11	30.9	9.80		PCB-48/75	61.0	4.90	
PCB-12/13	ND	9.80		PCB-50	ND	4.90	
PCB-14	ND	9.80		PCB-51	19.5	4.90	
PCB-15	ND	9.80		PCB-52/69	277	4.90	
PCB-16/32	98.1	4.90		PCB-53	45.5	4.90	
PCB-17	69.9	4.90		PCB-54	ND	4.90	
PCB-18	150	4.90		PCB-55	ND	4.90	
PCB-19	16.5	4.90		PCB-56/60	137	4.90	
PCB-20/21/33	88.8	4.90		PCB-57	ND	4.90	
PCB-22	52.7	4.90		PCB-58	ND	4.90	
PCB-23	ND	4.90		PCB-61/70	265	4.90	
PCB-24/27	11.5	4.90		PCB-62	ND	4.90	
PCB-25	23.3	4.90		PCB-63	9.37	4.90	
PCB-26	27.2	4.90		PCB-65	ND	4.90	
PCB-28	123	4.90		PCB-67	10.1	4.90	
PCB-29	ND	4.90		PCB-68	ND	4.90	
PCB-30	ND	4.90		PCB-73	ND	4.90	
PCB-31	191	4.90		PCB-74	98.2	4.90	
PCB-34	ND	4.90		PCB-76/66	179	4.90	
PCB-35	ND	4.90		PCB-77	23.2	4.90	B
PCB-36	ND	4.90		PCB-78	ND	4.90	
PCB-37	20.6	4.90		PCB-79	5.59	4.90	
PCB-38	ND	4.90		PCB-80	ND	4.90	
PCB-39	ND	4.90		PCB-81	0.701	4.90	J
PCB-40	46.4	4.90		PCB-82	46.9	4.90	

Sample ID:	PRR1WATCME-09			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33674-001	Date Received: 29-Mar-12
Project:	PRR1177	Sample Size: 1.02 L	QC Batch No.: 4345	Date Extracted: 29-Mar-12
Date Collected:	28-Mar-12	%Solids: 1.11	Date Analyzed DB-1 30-Mar-12	
Time Collected:	1145			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.90	
PCB-84/92	138	4.90	
PCB-85/116	57.6	4.90	
PCB-86	ND	4.90	
PCB-87/117/125	99.5	4.90	
PCB-88/91	55.3	4.90	
PCB-89	ND	6.90	~~I~~ J
PCB-90/101	326	4.90	
PCB-93	ND	4.90	
PCB-94	ND	4.90	
PCB-95/98/102	259	4.90	
PCB-96	5.36	4.90	
PCB-97	99.6	4.90	
PCB-99	162	4.90	
PCB-100	4.98	4.90	
PCB-103	ND	4.90	
PCB-104	ND	4.90	
PCB-105	91.7	4.90	
PCB-106/118	259	4.90	~~B~~
PCB-107/109	21.3	4.90	
PCB-108/112	16.2	4.90	
PCB-110	367	4.90	
PCB-111/115	6.59	4.90	
PCB-113	ND	4.90	
PCB-114	6.52	4.90	
PCB-119	8.59	4.90	
PCB-120	ND	4.90	
PCB-121	ND	4.90	
PCB-122	ND	4.90	
PCB-123	5.37	4.90	
PCB-124	11.9	4.90	
PCB-126	4.90 ~~2.03~~	4.90	~~JB~~ JB

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	4.90	
PCB-128/162	63.6	4.90	
PCB-129	20.6	4.90	
PCB-130	28.8	4.90	
PCB-131	ND	4.90	
PCB-132/161	117	4.90	
PCB-133/142	13.8	4.90	
PCB-134/143	21.3	4.90	
PCB-135	40.6	4.90	
PCB-136	55.5	4.90	
PCB-137	25.1	4.90	
PCB-138/163/164	418	4.90	
PCB-139/149	257	4.90	
PCB-140	ND	4.90	
PCB-141	83.1	4.90	
PCB-144	16.0	4.90	
PCB-145	ND	4.90	
PCB-146/165	68.1	4.90	
PCB-147	9.01	4.90	
PCB-148	ND	4.90	
PCB-150	ND	4.90	
PCB-151	75.4	4.90	
PCB-152	ND	4.90	
PCB-153	439	4.90	
PCB-154	11.4	4.90	
PCB-155	21.9	4.90	
PCB-156	43.1	4.90	
PCB-157	10.2	4.90	
PCB-158/160	43.5	4.90	
PCB-159	8.59	4.90	
PCB-166	ND	4.90	
PCB-167	17.6	4.90	

Sample ID:	PRR1WATCME-09		EPA Method 1668A

Client Data

Name: ARCADIS U.S., Inc.
Project: PRR1177
Date Collected: 28-Mar-12
Time Collected: 1145

Sample Data

Matrix: Aqueous
Sample Size: 1.02 L
%Solids: 1.11

Laboratory Data

Lab Sample: 33674-001
QC Batch No.: 4345
Date Analyzed DB-1: 30-Mar-12
Date Received: 29-Mar-12
Date Extracted: 29-Mar-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	4.90	
PCB-169	ND	2.08	
PCB-170	138	4.90	
PCB-171	37.8	4.90	
PCB-172	22.6	4.90	
PCB-173	ND	4.90	
PCB-174	162	4.90	
PCB-175	7.38	4.90	
PCB-176	23.4	4.90	
PCB-177	95.5	4.90	
PCB-178	34.5	4.90	
PCB-179	82.7	4.90	
PCB-180	445	4.90	
PCB-181	ND	4.90	
PCB-182/187	218	4.90	
PCB-183	97.3	4.90	
PCB-184	ND	4.90	
PCB-185	17.3	4.90	
PCB-186	ND	4.90	
PCB-188	ND	4.90	
PCB-189	5.94	4.90	B
PCB-190	26.9	4.90	
PCB-191	5.84	4.90	
PCB-192	ND	4.90	
PCB-193	15.8	4.90	
PCB-194	102	4.90	
PCB-195	39.4	4.90	
PCB-196/203	131	4.90	
PCB-197	ND	4.90	
PCB-198	5.49	4.90	
PCB-199	124	4.90	
PCB-200	15.4	4.90	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	17.2	4.90	
PCB-202	29.3	4.90	
PCB-204	ND	4.90	
PCB-205	6.35	4.90	
PCB-206	73.7	4.90	
PCB-207	8.71	4.90	
PCB-208	22.1	4.90	
PCB-209	50.3	4.90	
Total monoCB	ND	4.90	
Total diCB	89.3	9.80	
Total triCB	872	4.90	
Total tetraCB	2090	4.90	B
Total pentaCB	2050	4.90	B
Total hexaCB	1910	4.90	B
Total heptaCB	1440	4.90	B
Total octaCB	470	4.90	
Total nonaCB	104	4.90	
Total decaCB	50.3	4.90	
Total PCB	9070	9.80	B

TEQ(WHO-2005 Mammal [(Min)]: 0.219

Sample ID:	PRR1WATCMI-09		EPA Method 1668A

Client Data

Name: ARCADIS U.S., Inc.
Project: PRR1177
Date Collected: 28-Mar-12
Time Collected: 1205

Sample Data

Matrix: Aqueous
Sample Size: 0.999 L
%Solids: 1.14

Laboratory Data

Lab Sample: 33674-002
QC Batch No.: 4345
Date Analyzed DB-1: 2-Apr-12
Date Received: 29-Mar-12
Date Extracted: 29-Mar-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	3490	5.01	
PCB-2	302	5.01	
PCB-3	362	5.01	
PCB-4/10	9360	10.0	
PCB-5/8	14500	10.0	
PCB-6	5360	10.0	
PCB-7/9	1880	10.0	
PCB-11	4310	10.0	
PCB-12/13	1430	10.0	
PCB-14	65.7	10.0	
PCB-15	2180	10.0	
PCB-16/32	16900	5.01	
PCB-17	12700	5.01	
PCB-18	29300	5.01	E J
PCB-19	2930	5.01	
PCB-20/21/33	14100	5.01	
PCB-22	8570	5.01	
PCB-23	30.8	5.01	
PCB-24/27	1980	5.01	
PCB-25	3810	5.01	
PCB-26	4230	5.01	
PCB-28	22800	5.01	
PCB-29	161	5.01	
PCB-30	26.5	5.01	
PCB-31	20900	5.01	
PCB-34	229	5.01	
PCB-35	385	5.01	
PCB-36	ND	5.01	
PCB-37	3570	5.01	
PCB-38	398	5.01	
PCB-39	ND	5.01	
PCB-40	3440	5.01	
PCB-41/64/71/72	14700	5.01	
PCB-42/59	6150	5.01	
PCB-43/49	16900	5.01	
PCB-44	19400	5.01	
PCB-45	3630	5.01	
PCB-46	1630	5.01	
PCB-47	5610	5.01	
PCB-48/75	4320	5.01	
PCB-50	89.3	5.01	
PCB-51	1450	5.01	
PCB-52/69	20400	5.01	
PCB-53	3480	5.01	
PCB-54	138	5.01	
PCB-55	271	5.01	
PCB-56/60	9450	5.01	
PCB-57	98.1	5.01	
PCB-58	60.3	5.01	
PCB-61/70	18100	5.01	
PCB-62	ND	5.01	
PCB-63	674	5.01	
PCB-65	12.4	5.01	
PCB-67	740	5.01	
PCB-68	67.8	5.01	
PCB-73	ND	5.01	
PCB-74	7310	5.01	
PCB-76/66	13400	5.01	
PCB-77	1100	5.01	B
PCB-78	ND	5.01	
PCB-79	218	5.01	
PCB-80	ND	5.01	
PCB-81	76.0	5.01	
PCB-82	2150	5.01	

Sample ID:	PRR1WATCMI-09			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33674-002	Date Received: 29-Mar-12
Project:	PRR1177	Sample Size: 0.999 L	QC Batch No.: 4345	Date Extracted: 29-Mar-12
Date Collected:	28-Mar-12	%Solids: 1.14	Date Analyzed DB-1 2-Apr-12	
Time Collected:	1205			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	12.0	5.01	
PCB-84/92	7060	5.01	
PCB-85/116	2570	5.01	
PCB-86	142	5.01	
PCB-87/117/125	4980	5.01	
PCB-88/91	2890	5.01	
PCB-89	354	5.01	
PCB-90/101	16300	5.01	
PCB-93	ND	5.01	
PCB-94	168	5.01	
PCB-95/98/102	13300	5.01	
PCB-96	176	5.01	
PCB-97	5080	5.01	
PCB-99	8020	5.01	
PCB-100	366	5.01	
PCB-103	246	5.01	
PCB-104	ND	52.8	~~I~~ J
PCB-105	3760	5.01	
PCB-106/118	11400	5.01	B
PCB-107/109	890	5.01	
PCB-108/112	775	5.01	
PCB-110	17300	5.01	
PCB-111/115	307	5.01	
PCB-113	ND	5.01	
PCB-114	288	5.01	
PCB-119	445	5.01	
PCB-120	62.6	5.01	
PCB-121	ND	5.01	
PCB-122	163	5.01	
PCB-123	221	5.01	
PCB-124	503	5.01	
PCB-126	56.2	5.01	B

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	5.01	
PCB-128/162	1730	5.01	
PCB-129	551	5.01	
PCB-130	784	5.01	
PCB-131	ND	5.01	
PCB-132/161	3530	5.01	
PCB-133/142	421	5.01	
PCB-134/143	664	5.01	
PCB-135	1330	5.01	
PCB-136	1810	5.01	
PCB-137	561	5.01	
PCB-138/163/164	12100	5.01	
PCB-139/149	7790	5.01	
PCB-140	88.5	5.01	
PCB-141	2280	5.01	
PCB-144	420	5.01	
PCB-145	5.28	5.01	
PCB-146/165	2050	5.01	
PCB-147	310	5.01	
PCB-148	43.1	5.01	
PCB-150	65.8	5.01	
PCB-151	2310	5.01	
PCB-152	19.8	5.01	
PCB-153	12000	5.01	
PCB-154	383	5.01	
PCB-155	1710	5.01	
PCB-156	1080	5.01	
PCB-157	237	5.01	
PCB-158/160	1260	5.01	
PCB-159	ND	5.01	
PCB-166	47.7	5.01	
PCB-167	450	5.01	

Sample ID: PRR1WATCMI-09			EPA Method 1668A
Client Data	**Sample Data**	**Laboratory Data**	
Name: ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33674-002	Date Received: 29-Mar-12
Project: PRR1177	Sample Size: 0.999 L	QC Batch No.: 4345	Date Extracted: 29-Mar-12
Date Collected: 28-Mar-12	%Solids: 1.14	Date Analyzed DB-1 2-Apr-12	
Time Collected: 1205			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	25.7	5.01	
PCB-169	5.01 ~~4.16~~	5.01	~~J,B~~ UB
PCB-170	2800	5.01	
PCB-171	789	5.01	
PCB-172	473	5.01	
PCB-173	77.3	5.01	
PCB-174	3500	5.01	
PCB-175	151	5.01	
PCB-176	526	5.01	
PCB-177	2050	5.01	
PCB-178	805	5.01	
PCB-179	1840	5.01	
PCB-180	7380	5.01	
PCB-181	ND	5.01	
PCB-182/187	4990	5.01	
PCB-183	2020	5.01	
PCB-184	57.0	5.01	
PCB-185	386	5.01	
PCB-186	ND	5.01	
PCB-188	20.8	5.01	
PCB-189	100	5.01	~~B~~
PCB-190	552	5.01	
PCB-191	109	5.01	
PCB-192	ND	5.01	
PCB-193	343	5.01	
PCB-194	1450	5.01	
PCB-195	595	5.01	
PCB-196/203	1910	5.01	
PCB-197	71.2	5.01	
PCB-198	94.6	5.01	
PCB-199	2000	5.01	
PCB-200	245	5.01	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	273	5.01	
PCB-202	470	5.01	
PCB-204	ND	5.01	
PCB-205	63.9	5.01	
PCB-206	942	5.01	
PCB-207	110	5.01	
PCB-208	273	5.01	
PCB-209	758	5.01	
Total monoCB	4150	5.01	
Total diCB	39000	10.0	
Total triCB	143000	5.01	J
Total tetraCB	153000	5.01	~~B~~
Total pentaCB	100000	5.01	~~B~~
Total hexaCB	56000	5.01	~~B~~
Total heptaCB	29000	5.01	~~B~~
Total octaCB	7180	5.01	
Total nonaCB	1320	5.01	
Total decaCB	758	5.01	
Total PCB	534000	10.0	~~B~~ J

TEQ(WHO-2005 Mammal [(Min)]: **6.41**

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33674 3.1°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1177	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-09	3/28/2012	11:45	water	Grab	1	X	X																
PRR1WATCMI-09	3/28/2012	12:05	water	Grab	1	X	X																

Requested Analyses	
1	Dioxins
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP Worksheet 15-4 for Effluent Samples and 15-5 for Influent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
TJ Gor	3/28/12	1400	3/29/12 0902			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

ARCADIS
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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1198 (200-10182)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17176R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1198 (200-10182) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-13	200-10182-1	Water	4/2/2012						X
PRR1WATCME-14	200-10182-2	Water	4/3/2012						X
PRR1WATGACI-05	200-10182-3	Water	4/3/2012		X				X
PRR1WATGACE-05	200-10182-4	Water	4/3/2012		X				X
TB04032012	200-10182-5	Water	4/3/2012		X				X
PRR1WATSP101-4	200-10182-6	Water	4/3/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS and COD DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The COD results were qualified as estimated because the matrix spike recovery was less than the lower control limit. The COD results may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or COD analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed using sample PRR1WATGACE-05 for COD analysis. All analytes associated with MS recoveries were within the control limits with the exception of the following analytes present in the table below.

Sample Location	Analyte	MS Recovery
PRR1WATGACE-05	COD	46 %

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 the analytical batch.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATGACE-05 was selected for the duplicate analysis for COD. The relative percent difference (RPD) between the sample and duplicate values obtained met the project measurement performance criteria.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x0 dilution in order to bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs

stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 10, 2012

PEER REVIEW: Dennis Capria

DATE: October 15, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1198 - VOCs

ANALYTE	Units	PRR1WATGACE-05	LQ	VQ	PRR1WATGACI-05	LQ	VQ
2-Butanone	ug/L	10	U	U	22		
Chlorobenzene	ug/L	1	U	U	19		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1198 - Miscellaneous

ANALYTE	Units	PRR1WATCME-13	LQ	VQ	PRR1WATCME-14	LQ	VQ	PRR1WATGACE-05	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			238		J
Total Suspended Solids	mg/L	6.9			2.2			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1198 - Miscellaneous

ANALYTE	Units	PRR1WATGACI-05	LQ	VQ	PRR1WATSP101-4	LQ	VQ
Chemical Oxygen Demand	mg/L	273		J	NA		
Total Suspended Solids	mg/L	NA			32.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1198

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10182-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/04/2012

% Moisture: not dec. Date Analyzed: 04/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	22	
108-90-7	Chlorobenzene	19	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1198

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10182-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEF06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/04/2012

% Moisture: not dec. Date Analyzed: 04/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04032012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1198

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10182-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEF09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/04/2012

% Moisture: not dec. Date Analyzed: 04/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-13 Lab Sample ID: 200-10182-1

Lab Name: TestAmerica Burlington Job No.: 200-10182-2

SDG ID.: PRR1198

Matrix: Water Date Sampled: 04/02/2012 19:00

Reporting Basis: WET Date Received: 04/04/2012 10:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.9	1.8		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-14 Lab Sample ID: 200-10182-2

Lab Name: TestAmerica Burlington Job No.: 200-10182-2

SDG ID.: PRR1198

Matrix: Water Date Sampled: 04/03/2012 13:05

Reporting Basis: WET Date Received: 04/04/2012 10:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	2.2	1.8		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-05 Lab Sample ID: 200-10182-3

Lab Name: TestAmerica Burlington Job No.: 200-10182-2

SDG ID.: PRR1198

Matrix: Water Date Sampled: 04/03/2012 13:20

Reporting Basis: WET Date Received: 04/04/2012 10:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	273	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-05 Lab Sample ID: 200-10182-4

Lab Name: TestAmerica Burlington Job No.: 200-10182-2

SDG ID.: PRR1198

Matrix: Water Date Sampled: 04/03/2012 13:10

Reporting Basis: WET Date Received: 04/04/2012 10:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	238	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-4 Lab Sample ID: 200-10182-6

Lab Name: TestAmerica Burlington Job No.: 200-10182-2

SDG ID.: PRR1198

Matrix: Water Date Sampled: 04/03/2012 13:30

Reporting Basis: WET Date Received: 04/04/2012 10:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	32.4	1.8		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1198	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-13	4/2/2012	19:00	water	Grab	1			X															
PRR1WATCME-14	4/3/2012	13:05	water	Grab	1			X															
PRR1WATGACI-05	4/3/2012	13:20	water	Grab	4	X	X																
PRR1WATGACE-05	4/3/2012	13:10	water	Grab	12	X	X																
TB04032012	4/3/2012		water	—	3	X																	
PRR1WATSP101-4	4/3/2012	13:30	water	Grab	1			X															

Page 1 of 1	Requested Analyses
1	2-Butanone, Chlorobenzene
2	COD
3	TSS
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Triple volume submitted for PRR1WATGACE-05 for MS/MSD

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 1.0°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Les Bowers	4/3/12	1400	TLOR			
TLOR	4/3/12	1600	[illegible] 4/3/12 1645			

04/07/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1200 (200-10228, 200-10231 and 200-10232)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17188R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1200 (200-10228, 200-10231 and 200-10232) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-16	200-10228-1	Water	4/5/2012		X	X	X	X	X
PRR1WATCME-15	200-10228-2	Water	4/4/2012						X
PRR1WATCMI-16	200-10232-2	Water	4/5/2012		X	X	X		
TB04052012	200-10232-3	Water	4/5/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in one sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

The method blank exhibited concentrations less than the PQL for butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in sample PRR1WATCME-16 at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Several surrogate recoveries were outside control limits for sample location PRR1WATCMI-16 due to a 500-fold dilution performed on this sample.

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	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

Compounds were detected in the associated trip blank; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The percent difference (%D) between columns exceeded 100% for 2,4'-DDD, 2,4'-DDE, 2,4'-DDT and delta-BHC which were detected above the reporting limit for sample location PRR1WATCMI-16. The results were flagged as estimated with possible interference.

Minor

The method blank exhibited low level concentrations of alpha-BHC, beta-BHC, delta-BHC, Heptachlor, Dieldrin, 4,4'-DDT and gamma-Chlordane. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

Two sample locations exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

One surrogate exhibited elevated recoveries in one sample. Therefore, positive results for the affected compounds indicate potential high bias.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for alpha-BHC, beta-BHC, delta-BHC, Heptachlor, Dieldrin and gamma-Chlordane. These compounds were detected in sample

PRR1WATCME-16 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Column 1 Recovery	Column 2 Recovery
PRR1WATCMI-16	Tetrachloro-m-xylene	>UL	>UL
	Decachlorobiphenyl	AC	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 column are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 150%	Nondetect	No action
	Detect	J
< 30% but > 10%	Nondetect	UJ
	Detect	J
< 10%	Nondetect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Nondetect	No Action
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and

equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-16	gamma-BHC	999.9%
	Aldrin	447.4%
	Heptachlor epoxide	109.1%
	Endrin	999.9%
	Endosulfan II	999.9%
	4,4'-DDT	38.2%
	2,4'-DDT	54.4%
PRR1WATCMI-16	2,4'-DDE	226.4%
	2,4'-DDD	999.9%
	2,4'-DDT	192.0%
	delta-BHC	111.7%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

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
PRR1WATCMI-16	2,4'-DDE	2.2 E	2.1 D	2.1 D
	delta-BHC	1.1 E	1.1 D	1.1 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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The MS/MSD recovery for Dinoseb associated with sample location PRR1WATCME-16 was below 10%; therefore the Dinoseb result is rejected for this sample location.

Minor

Sample location PRR1WATCME-16 was re-extracted outside of the holding time due to low LCS recovery associated with the original extraction. The results associated with this sample are qualified as estimated.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Sample PRR1WATCME-16 was originally extracted within holding time; however, the associated LCS exhibited recovery for Dinoseb below 10%. The re-extraction exhibited acceptable LCS recoveries.

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

Sample Locations	Holding Time	Criteria
PRR1WATCME-16	Extraction Completed in 8 Days	7 Days

Sample results associated with sample locations analyzed by analytical method SW-846 8051 were qualified, as specified in the table below. All other holding times were met.

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

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Column 1 Recovery	Column 2 Recovery
PRR1WATCMI-16	2,4-DCPA	D	D

D – Dilution

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 column are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 150%	Nondetect	No action
	Detect	J
< 30% but > 10%	Nondetect	UJ
	Detect	J
< 10%	Nondetect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Nondetect	No Action
	Detect	

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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
PRR1WATCME-16	Dinoseb	0%	0%

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	

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain re-extraction and re-analysis of the samples due to QC failures associated with dinoseb. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Lead. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

The laboratory duplicate RPD exceeded the control limit for Arsenic. This analyte associated with sample PRR1WATCME-16 is qualified as estimated.

The serial dilution %D exceeded the control limit for Nickel and Selenium. These analytes associated with sample PRR1WATCME-16 are qualified as estimated.

The MS analysis of sample PRR1WATCME-16 exhibited 0% recovery for Cyanide; however, the post digestion spike recovery for cyanide was within control limits. Cyanide is qualified as estimated for this sample.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Lead. This analyte was detected in sample PRR1WATCME-16 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL (or at the detected sample

concentration if above the PQL) and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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
PRR1WATCME-16	Cyanide	0%

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
PRR1WATCME-16	Cyanide	0%	98%

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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
PRR1WATCME-16	Arsenic	22%

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

6. SERIAL DILUTION

Sample PRR1WATCME-16 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained met method measurement performance criteria for all analytes with the exception of those listed in the table below.

Sample Locations	Analytes	Serial Dilution (%D)
PRR1WATCME-16	Nickel	14%

Sample Locations	Analytes	Serial Dilution (%D)
	Selenium	12%

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

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Analytes were detected in the associated QA blank for TOC; however, the associated sample results were greater than the BAL. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

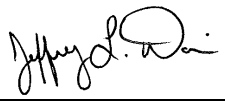
9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: September 7, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - PCBs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ
Aroclor-1016	ug/L	0.97 U		U
Aroclor-1221	ug/L	0.97 U		U
Aroclor-1232	ug/L	0.97 U		U
Aroclor-1242	ug/L	0.97 U		U
Aroclor-1248	ug/L	0.97 U		U
Aroclor-1254	ug/L	0.97 U		U
Aroclor-1260	ug/L	0.97 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Pesticides

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,4'-DDD	ug/L	0.0044	J	J	0.57	P	JN
2,4'-DDE	ug/L	0.0098	U	U	2.1	P D	DJN
2,4'-DDT	ug/L	0.0098	J P	U	1.1	P	JN
4,4'-DDD	ug/L	0.0082	J	J	NA		
4,4'-DDE	ug/L	0.0014	J	J	NA		
4,4'-DDT	ug/L	0.0014	J P B	J	NA		
Aldrin	ug/L	0.0049	J P	U	NA		
Alpha-BHC	ug/L	0.0049	J P B	UB	NA		
Alpha-Chlordane	ug/L	0.0049	U	U	NA		
Beta-BHC	ug/L	0.0049	J P B	UB	NA		
Delta-BHC	ug/L	0.0049	J P B	UB	1.1	P D	DJN
Dieldrin	ug/L	0.0098	J P B	UB	NA		
Endosulfan I	ug/L	0.00036	J	J	NA		
Endosulfan II	ug/L	0.0098	J P	U	NA		
Endosulfan Sulfate	ug/L	0.0098	U	U	NA		
Endrin	ug/L	0.0098	J P	U	NA		
Endrin Aldehyde	ug/L	0.0098	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0049	J P	U	NA		
Gamma-Chlordane	ug/L	0.0049	J P B	UB	NA		
Heptachlor	ug/L	0.0049	J P B	UB	NA		
Heptachlor Epoxide	ug/L	0.0049	J P	U	NA		
Toxaphene	ug/L	0.49	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Herbicides

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,4,5-T	ug/L	0.45	J H	J	34000		
2,4-D	ug/L	0.9	J H	J	NA		
2,4-DB	ug/L	1.7	U	UJ	NA		
Dinoseb	ug/L		U H	R	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - VOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
1,1,1-Trichloroethane	ug/L	0.5	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	0.5	U	U	NA		
1,1,2-Trichloroethane	ug/L	0.5	U	U	NA		
1,1-Dichloroethane	ug/L	0.5	U	U	NA		
1,1-Dichloroethene	ug/L	0.5	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	0.5	U	U	13		
1,2,4-Trichlorobenzene	ug/L	0.5	U	U	NA		
1,2-Dichlorobenzene	ug/L	0.5	U	U	NA		
1,2-Dichloroethane	ug/L	0.5	U	U	NA		
1,2-Dichloropropane	ug/L	0.5	U	U	NA		
1,3-Dichlorobenzene	ug/L	0.5	U	U	NA		
1,4-Dichlorobenzene	ug/L	0.5	U	U	NA		
2-Butanone	ug/L	5	U	U	87		
Acrolein	ug/L	10	U	U	NA		
Acrylonitrile	ug/L	10	U	U	NA		
Benzene	ug/L	0.5	U	U	NA		
Bromodichloromethane	ug/L	0.5	U	U	NA		
Bromoform	ug/L	0.5	U	U	NA		
Bromomethane	ug/L	0.5	U	U	NA		
Carbon Tetrachloride	ug/L	0.5	U	U	NA		
Chlorobenzene	ug/L	0.5	U	U	NA		
Chloroethane	ug/L	0.5	U	U	NA		
Chloroform	ug/L	0.5	U	U	NA		
Chloromethane	ug/L	0.5	U	U	NA		
cis-1,3-Dichloropropene	ug/L	0.5	U	U	NA		
Dibromochloromethane	ug/L	0.5	U	U	NA		
Ethylbenzene	ug/L	0.5	U	U	NA		
Methylene Chloride	ug/L	0.5	U	U	NA		
Tetrachloroethene	ug/L	0.5	U	U	NA		
Toluene	ug/L	0.5	U	U	NA		
trans-1,2-Dichloroethene	ug/L	0.5	U	U	NA		
trans-1,3-Dichloropropene	ug/L	0.5	U	U	NA		
Trichloroethene	ug/L	0.5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - VOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
Vinyl Chloride	ug/L	0.5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - SVOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	5	U	U	NA		
2,4,5-Trichlorophenol	ug/L	0.36	J	J	24000		
2,4,6-Trichlorophenol	ug/L	5	U	U	NA		
2,4-Dichlorophenol	ug/L	5	U	U	NA		
2,4-Dimethylphenol	ug/L	5	U	U	NA		
2,4-Dinitrophenol	ug/L	10	U	U	NA		
2,4-Dinitrotoluene	ug/L	5	U	U	NA		
2,6-Dinitrotoluene	ug/L	5	U	U	NA		
2-Chlorophenol	ug/L	5	U	U	NA		
2-Nitrophenol	ug/L	5	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	5	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	10	U	U	5100	U	U
4-Nitrophenol	ug/L	10	U	U	NA		
Anthracene	ug/L	5	U	U	NA		
Benzidine	ug/L	10	U	U	NA		
Benzo(a)anthracene	ug/L	5	U	U	NA		
Benzo(a)pyrene	ug/L	5	U	U	NA		
Benzo(b)fluoranthene	ug/L	5	U	U	NA		
Benzo(k)fluoranthene	ug/L	5	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	5	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	5	J B	UB	NA		
Butylbenzylphthalate	ug/L	5	J B	UB	NA		
Chrysene	ug/L	5	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	5	U	U	NA		
Diethylphthalate	ug/L	5	U	U	NA		
Dimethylphthalate	ug/L	5	U	U	NA		
Di-n-Butylphthalate	ug/L	5	J B	UB	NA		
Fluoranthene	ug/L	5	U	U	NA		
Fluorene	ug/L	5	U	U	NA		
Hexachlorobenzene	ug/L	5	U	U	NA		
Hexachlorobutadiene	ug/L	5	U	U	NA		
Hexachlorocyclopentadiene	ug/L	5	U	U	NA		
Hexachloroethane	ug/L	5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - SVOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	5	U	U	NA		
Isophorone	ug/L	5	U	U	NA		
Naphthalene	ug/L	5	U	U	NA		
Nitrobenzene	ug/L	5	U	U	NA		
N-Nitrosodimethylamine	ug/L	10	U	U	NA		
N-Nitrosodiphenylamine	ug/L	5	U	U	NA		
Pentachlorophenol	ug/L	10	U	U	NA		
Phenanthrene	ug/L	5	U	U	NA		
Phenol	ug/L	5	U	U	NA		
Pyrene	ug/L	5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Inorganics

ANALYTE	Units	PRR1WATCME-16	LQ	VQ
Antimony	ug/L	3.8		
Arsenic	ug/L	6.6	*	J
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2.4		
Copper	ug/L	5.3		
Cyanide	ug/L	10	U N	UJ
Lead	ug/L	1.2		UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	19.3	E	J
Selenium	ug/L	15.4	E	J
Silver	ug/L	0.15	J	J
Zinc	ug/L	12.9		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Miscellaneous

ANALYTE	Units	PRR1WATCME-15	LQ	VQ	PRR1WATCME-16	LQ	VQ
Total Organic Carbon	mg/L	NA			3.6	B	
Total Suspended Solids	mg/L	12.3			6.8		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: RJYQT06.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/06/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/10/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	5.0	U
111-44-4	Bis(2-chloroethyl)ether	5.0	U
95-57-8	2-Chlorophenol	5.0	U
108-60-1	2,2'-Oxybis(1-chloropropane)	5.0	U
67-72-1	Hexachloroethane	5.0	U
98-95-3	Nitrobenzene	5.0	U
78-59-1	Isophorone	5.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
91-20-3	Naphthalene	5.0	U
87-68-3	Hexachlorobutadiene	5.0	U
77-47-4	Hexachlorocyclopentadiene	5.0	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	0.36	J
131-11-3	Dimethylphthalate	5.0	U
606-20-2	2,6-Dinitrotoluene	5.0	U
51-28-5	2,4-Dinitrophenol	10	U
100-02-7	4-Nitrophenol	10	U
121-14-2	2,4-Dinitrotoluene	5.0	U
84-66-2	Diethylphthalate	5.0	U
86-73-7	Fluorene	5.0	U
534-52-1	4,6-Dinitro-2-methylphenol	10	U
86-30-6	N-Nitrosodiphenylamin[1]	5.0	U
118-74-1	Hexachlorobenzene	5.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.0	U
120-12-7	Anthracene	5.0	U
84-74-2	Di-n-butylphthalate	5.0 ~~0.17~~	~~J B~~ UB
206-44-0	Fluoranthene	5.0	U
92-87-5	Benzidine	10	U
129-00-0	Pyrene	5.0	U

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: RJYQT06.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/06/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/10/2012

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
85-68-7	Butylbenzylphthalate	5.0	~~0.31~~	~~J B~~ uB
91-94-1	3,3'-Dichlorobenzidine		5.0	U
56-55-3	Benzo(a)anthracene		5.0	U
218-01-9	Chrysene		5.0	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.0	~~0.66~~	~~J B~~ uB
205-99-2	Benzo(b)fluoranthene		5.0	U
207-08-9	Benzo(k)fluoranthene		5.0	U
50-32-8	Benzo(a)pyrene		5.0	U
193-39-5	Indeno(1,2,3-cd)pyrene		5.0	U
53-70-3	Dibenzo(a,h)anthracene		5.0	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2
Sample wt/vol: 980 (g/mL) mL Lab File ID: RJYQX07.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 04/06/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/06/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/11/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 500.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	24000	
534-52-1	4,6-Dinitro-2-methylphenol	5100	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012
% Moisture: not dec. Date Analyzed: 04/09/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012
% Moisture: not dec. Date Analyzed: 04/09/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG18.D
Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012
% Moisture: not dec. Date Analyzed: 04/09/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 8.8
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	87	
87-61-6	1,2,3-Trichlorobenzene	13	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04052012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	2.2	J
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.29	J
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.076	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04052012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.15	J
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 09AP121545-R051.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q	
319-84-6	alpha-BHC	0.0049	~~0.00065~~	~~J P B~~	UB
319-85-7	beta-BHC	0.0049	~~0.00061~~	~~J P B~~	UB
319-86-8	delta-BHC	0.0049	~~0.00068~~	~~J P B~~	UB
58-89-9	gamma-BHC (Lindane)	0.0049	~~0.000038~~	~~J P~~ U	
76-44-8	Heptachlor	0.0049	~~0.00037~~	~~J P B~~	UB
309-00-2	Aldrin	0.0049	~~0.00024~~	~~J P~~ U	
1024-57-3	Heptachlor epoxide	0.0049	~~0.00016~~	~~J P~~ U	
959-98-8	Endosulfan I		0.00036	J	
60-57-1	Dieldrin	0.0098	~~0.000088~~	~~J P B~~	UB
72-55-9	4,4'-DDE		0.0014	J	
72-20-8	Endrin	0.0098	~~0.00011~~	~~J P~~ U	
33213-65-9	Endosulfan II	0.0098	~~0.00024~~	~~J P~~ U	
72-54-8	4,4'-DDD		0.0082	J	
1031-07-8	Endosulfan sulfate		0.0098	U	
50-29-3	4,4'-DDT	0.0014	~~0.0014~~	~~J P B~~	J
7421-93-4	Endrin aldehyde		0.0098	U	
5103-71-9	alpha-Chlordane		0.0049	U	
5103-74-2	gamma-Chlordane	0.0049	~~0.00024~~	~~J P B~~	UB
8001-35-2	Toxaphene		0.49	U	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10AP121504-R051.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/10/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.0098	U
789-02-6	2,4'-DDT	0.0098 ~~0.0030~~ ~~J P~~ U	
53-19-0	2,4'-DDD	0.0044	J

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2
Sample wt/vol: 1050 (g/mL) mL Lab File ID: 10AP121504-R081.D
% Moisture: Decanted: (Y/N) Date Received: 04/06/2012
Extraction: (Type) SEPF Date Extracted: 04/06/2012
Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/10/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
3424-82-6	2,4'-DDE	2.1	~~2.2~~	~~E P~~ D JN
53-19-0	2,4'-DDD		0.57	~~P~~ JN
789-02-6	2,4'-DDT		1.1	~~P~~ JN

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 10AP121954-R021.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/10/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	2.1	P D
53-19-0	2,4'-DDD	0.54	P D
789-02-6	2,4'-DDT	0.96	P D

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 09AP122119-R031.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	1.1	~~P~~ D J N

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 09AP121545-R101.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	1.1	E P

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1030 (g/mL) mL Lab File ID: 09AP121003-R051.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
12674-11-2	Aroclor-1016	0.97	U
11104-28-2	Aroclor-1221	0.97	U
11141-16-5	Aroclor-1232	0.97	U
53469-21-9	Aroclor-1242	0.97	U
12672-29-6	Aroclor-1248	0.97	U
11097-69-1	Aroclor-1254	0.97	U
11096-82-5	Aroclor-1260	0.97	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCME-16 Lab Sample ID: 200-10232-1

Matrix: Water Lab File ID: 12ap121444-r051.d

Analysis Method: 8151A Date Collected: 04/05/2012 13:00

Extraction Method: 8151A Date Extracted: 04/10/2012 09:36

Sample wt/vol: 995(mL) Date Analyzed: 04/12/2012 17:22

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36828 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.7	U	1.7	0.47
88-85-7	Dinoseb	0.95	U *	0.95	0.19
93-76-5	2,4,5-T	0.35	J	0.47	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	75		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCME-16 Lab Sample ID: 200-10232-1

Matrix: Water Lab File ID: 12ap121444-r051.d

Analysis Method: 8151A Date Collected: 04/05/2012 13:00

Extraction Method: 8151A Date Extracted: 04/10/2012 09:36

Sample wt/vol: 995(mL) Date Analyzed: 04/12/2012 17:22

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36828 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.80	J	1.9	0.65

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	78		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCME-16 RE Lab Sample ID: 200-10232-1 RE

Matrix: Water Lab File ID: 16ap121238-r031.d

Analysis Method: 8151A Date Collected: 04/05/2012 13:00

Extraction Method: 8151A Date Extracted: 04/13/2012 10:21

Sample wt/vol: 995(mL) Date Analyzed: 04/16/2012 14:08

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37005 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.90	J H	1.9	0.65
94-82-6	2,4-DB	1.7	U H J	1.7	0.47
88-85-7	Dinoseb	~~0.95~~	~~U H~~ R	~~0.95~~	0.19
93-76-5	2,4,5-T	0.45	J H	0.47	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	89		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCMI-16 Lab Sample ID: 200-10232-2

Matrix: Water Lab File ID: 12ap121444-r081.d

Analysis Method: 8151A Date Collected: 04/05/2012 12:45

Extraction Method: 8151A Date Extracted: 04/10/2012 09:36

Sample wt/vol: 955(mL) Date Analyzed: 04/12/2012 19:08

Con. Extract Vol.: 10000(uL) Dilution Factor: 10000

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36828 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	34000		4900	1400

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1200
Matrix: WATER Lab Sample Id: 200-10232-1
% Solids: Date Received: 04/06/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.8			MS
7440-38-2	Arsenic	6.6		~~*~~ J	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.4			MS
7440-50-8	Copper	5.3			MS
7439-92-1	Lead	1.2	UB		MS
7440-02-0	Nickel	19.3		~~E~~ J	MS
7782-49-2	Selenium	15.4		~~E~~ J	MS
7440-22-4	Silver	0.15	J		MS
7440-66-6	Zinc	12.9			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1200
Matrix: WATER Lab Sample Id: 200-10232-1
% Solids: Date Received: 04/06/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1200

Matrix: WATER Lab Sample Id: 200-10232-1

% Solids: Date Received: 04/06/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U	J ~~N~~	AS

Color Before: WHITE Clarity Before: CLOUDY Texture:

Color After: Clarity After: Artifacts:

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-16 | Lab Sample ID: 200-10232-1

Lab Name: TestAmerica Burlington | Job No.: 200-10232-2

SDG ID.: PRR1200

Matrix: Water | Date Sampled: 04/05/2012 13:00

Reporting Basis: WET | Date Received: 04/06/2012 10:10

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	3.6	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-16
Lab Sample ID: 200-10228-1
Lab Name: TestAmerica Burlington
Job No.: 200-10228-1
SDG ID.: PRR1200
Matrix: Water
Date Sampled: 04/05/2012 13:00
Reporting Basis: WET
Date Received: 04/06/2012 10:10

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.8	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-15
Lab Sample ID: 200-10228-2
Lab Name: TestAmerica Burlington
Job No.: 200-10228-1
SDG ID.: PRR1200
Matrix: Water
Date Sampled: 04/04/2012 16:00
Reporting Basis: WET
Date Received: 04/06/2012 10:10

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	12.3	1.9		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
80009964.0002.70004	Tierra Phase I Removal	PRR1200	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-16	4/5/2012	13:00	water	Grab	52	X	X	X	X	X	X	X	X	X	X								
PRR1WATCMI-16	4/5/2012	12:45	water	Grab	9		X	X		X			X										
TB04052012	4/5/2012		water	—	3		X																
PRR1WATCME-15	4/4/2012	16:00	water	Grab	1									X									

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	WET Testing
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

Triple volume collected for MS/MSD for PRR1WATCME-15 (except TSS and WET Testing)

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/5/12	1400	[signature] 4/6/12 1010 TA BUR			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1200 (200-10228, 200-10231 and 200-10232)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17188R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1200 (200-10228, 200-10231 and 200-10232) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-16	200-10228-1	Water	4/5/2012		X	X	X	X	X
PRR1WATCME-15	200-10228-2	Water	4/4/2012						X
PRR1WATCMI-16	200-10232-2	Water	4/5/2012		X	X	X		
TB04052012	200-10232-3	Water	4/5/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in one sample at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

The method blank exhibited concentrations less than the PQL for butylbenzylphthalate, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate. These compounds were detected in sample PRR1WATCME-16 at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These sample results are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Several surrogate recoveries were outside control limits for sample location PRR1WATCMI-16 due to a 500-fold dilution performed on this sample.

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	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

Compounds were detected in the associated trip blank; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The percent difference (%D) between columns exceeded 100% for 2,4'-DDD, 2,4'-DDE, 2,4'-DDT and delta-BHC which were detected above the reporting limit for sample location PRR1WATCMI-16. The results were flagged as estimated with possible interference.

Minor

The method blank exhibited low level concentrations of alpha-BHC, beta-BHC, delta-BHC, Heptachlor, Dieldrin, 4,4'-DDT and gamma-Chlordane. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

Two sample locations exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

One surrogate exhibited elevated recoveries in one sample. Therefore, positive results for the affected compounds indicate potential high bias.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for alpha-BHC, beta-BHC, delta-BHC, Heptachlor, Dieldrin and gamma-Chlordane. These compounds were detected in sample

PRR1WATCME-16 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Column 1 Recovery	Column 2 Recovery
PRR1WATCMI-16	Tetrachloro-m-xylene	>UL	>UL
	Decachlorobiphenyl	AC	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 column are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 150%	Nondetect	No action
	Detect	J
< 30% but > 10%	Nondetect	UJ
	Detect	J
< 10%	Nondetect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Nondetect	No Action
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and

equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-16	gamma-BHC	999.9%
	Aldrin	447.4%
	Heptachlor epoxide	109.1%
	Endrin	999.9%
	Endosulfan II	999.9%
	4,4'-DDT	38.2%
	2,4'-DDT	54.4%
PRR1WATCMI-16	2,4'-DDE	226.4%
	2,4'-DDD	999.9%
	2,4'-DDT	192.0%
	delta-BHC	111.7%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

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
PRR1WATCMI-16	2,4'-DDE	2.2 E	2.1 D	2.1 D
	delta-BHC	1.1 E	1.1 D	1.1 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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The MS/MSD recovery for Dinoseb associated with sample location PRR1WATCME-16 was below 10%; therefore the Dinoseb result is rejected for this sample location.

Minor

Sample location PRR1WATCME-16 was re-extracted outside of the holding time due to low LCS recovery associated with the original extraction. The results associated with this sample are qualified as estimated.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Sample PRR1WATCME-16 was originally extracted within holding time; however, the associated LCS exhibited recovery for Dinoseb below 10%. The re-extraction exhibited acceptable LCS recoveries.

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

Sample Locations	Holding Time	Criteria
PRR1WATCME-16	Extraction Completed in 8 Days	7 Days

Sample results associated with sample locations analyzed by analytical method SW-846 8051 were qualified, as specified in the table below. All other holding times were met.

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

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Column 1 Recovery	Column 2 Recovery
PRR1WATCMI-16	2,4-DCPA	D	D

D – Dilution

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 column are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 150%	Nondetect	No action
	Detect	J
< 30% but > 10%	Nondetect	UJ
	Detect	J
< 10%	Nondetect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Nondetect	No Action
	Detect	

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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
PRR1WATCME-16	Dinoseb	0%	0%

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	

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain re-extraction and re-analysis of the samples due to QC failures associated with dinoseb. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Lead. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

The laboratory duplicate RPD exceeded the control limit for Arsenic. This analyte associated with sample PRR1WATCME-16 is qualified as estimated.

The serial dilution %D exceeded the control limit for Nickel and Selenium. These analytes associated with sample PRR1WATCME-16 are qualified as estimated.

The MS analysis of sample PRR1WATCME-16 exhibited 0% recovery for Cyanide; however, the post digestion spike recovery for cyanide was within control limits. Cyanide is qualified as estimated for this sample.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Lead. This analyte was detected in sample PRR1WATCME-16 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL (or at the detected sample

concentration if above the PQL) and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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
PRR1WATCME-16	Cyanide	0%

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
PRR1WATCME-16	Cyanide	0%	98%

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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
PRR1WATCME-16	Arsenic	22%

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

6. SERIAL DILUTION

Sample PRR1WATCME-16 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained met method measurement performance criteria for all analytes with the exception of those listed in the table below.

Sample Locations	Analytes	Serial Dilution (%D)
PRR1WATCME-16	Nickel	14%

Sample Locations	Analytes	Serial Dilution (%D)
	Selenium	12%

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

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Analytes were detected in the associated QA blank for TOC; however, the associated sample results were greater than the BAL. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

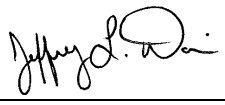
9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: September 7, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - PCBs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ
Aroclor-1016	ug/L	0.97 U		U
Aroclor-1221	ug/L	0.97 U		U
Aroclor-1232	ug/L	0.97 U		U
Aroclor-1242	ug/L	0.97 U		U
Aroclor-1248	ug/L	0.97 U		U
Aroclor-1254	ug/L	0.97 U		U
Aroclor-1260	ug/L	0.97 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Pesticides

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,4'-DDD	ug/L	0.0044	J	J	0.57	P	JN
2,4'-DDE	ug/L	0.0098	U	U	2.1	P D	DJN
2,4'-DDT	ug/L	0.0098	J P	U	1.1	P	JN
4,4'-DDD	ug/L	0.0082	J	J	NA		
4,4'-DDE	ug/L	0.0014	J	J	NA		
4,4'-DDT	ug/L	0.0014	J P B	J	NA		
Aldrin	ug/L	0.0049	J P	U	NA		
Alpha-BHC	ug/L	0.0049	J P B	UB	NA		
Alpha-Chlordane	ug/L	0.0049	U	U	NA		
Beta-BHC	ug/L	0.0049	J P B	UB	NA		
Delta-BHC	ug/L	0.0049	J P B	UB	1.1	P D	DJN
Dieldrin	ug/L	0.0098	J P B	UB	NA		
Endosulfan I	ug/L	0.00036	J	J	NA		
Endosulfan II	ug/L	0.0098	J P	U	NA		
Endosulfan Sulfate	ug/L	0.0098	U	U	NA		
Endrin	ug/L	0.0098	J P	U	NA		
Endrin Aldehyde	ug/L	0.0098	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0049	J P	U	NA		
Gamma-Chlordane	ug/L	0.0049	J P B	UB	NA		
Heptachlor	ug/L	0.0049	J P B	UB	NA		
Heptachlor Epoxide	ug/L	0.0049	J P	U	NA		
Toxaphene	ug/L	0.49	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Herbicides

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,4,5-T	ug/L	0.45	J H	J	34000		
2,4-D	ug/L	0.9	J H	J	NA		
2,4-DB	ug/L	1.7	U	UJ	NA		
Dinoseb	ug/L		U H	R	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - VOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
1,1,1-Trichloroethane	ug/L	0.5	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	0.5	U	U	NA		
1,1,2-Trichloroethane	ug/L	0.5	U	U	NA		
1,1-Dichloroethane	ug/L	0.5	U	U	NA		
1,1-Dichloroethene	ug/L	0.5	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	0.5	U	U	13		
1,2,4-Trichlorobenzene	ug/L	0.5	U	U	NA		
1,2-Dichlorobenzene	ug/L	0.5	U	U	NA		
1,2-Dichloroethane	ug/L	0.5	U	U	NA		
1,2-Dichloropropane	ug/L	0.5	U	U	NA		
1,3-Dichlorobenzene	ug/L	0.5	U	U	NA		
1,4-Dichlorobenzene	ug/L	0.5	U	U	NA		
2-Butanone	ug/L	5	U	U	87		
Acrolein	ug/L	10	U	U	NA		
Acrylonitrile	ug/L	10	U	U	NA		
Benzene	ug/L	0.5	U	U	NA		
Bromodichloromethane	ug/L	0.5	U	U	NA		
Bromoform	ug/L	0.5	U	U	NA		
Bromomethane	ug/L	0.5	U	U	NA		
Carbon Tetrachloride	ug/L	0.5	U	U	NA		
Chlorobenzene	ug/L	0.5	U	U	NA		
Chloroethane	ug/L	0.5	U	U	NA		
Chloroform	ug/L	0.5	U	U	NA		
Chloromethane	ug/L	0.5	U	U	NA		
cis-1,3-Dichloropropene	ug/L	0.5	U	U	NA		
Dibromochloromethane	ug/L	0.5	U	U	NA		
Ethylbenzene	ug/L	0.5	U	U	NA		
Methylene Chloride	ug/L	0.5	U	U	NA		
Tetrachloroethene	ug/L	0.5	U	U	NA		
Toluene	ug/L	0.5	U	U	NA		
trans-1,2-Dichloroethene	ug/L	0.5	U	U	NA		
trans-1,3-Dichloropropene	ug/L	0.5	U	U	NA		
Trichloroethene	ug/L	0.5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - VOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
Vinyl Chloride	ug/L	0.5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - SVOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	5	U	U	NA		
2,4,5-Trichlorophenol	ug/L	0.36	J	J	24000		
2,4,6-Trichlorophenol	ug/L	5	U	U	NA		
2,4-Dichlorophenol	ug/L	5	U	U	NA		
2,4-Dimethylphenol	ug/L	5	U	U	NA		
2,4-Dinitrophenol	ug/L	10	U	U	NA		
2,4-Dinitrotoluene	ug/L	5	U	U	NA		
2,6-Dinitrotoluene	ug/L	5	U	U	NA		
2-Chlorophenol	ug/L	5	U	U	NA		
2-Nitrophenol	ug/L	5	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	5	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	10	U	U	5100	U	U
4-Nitrophenol	ug/L	10	U	U	NA		
Anthracene	ug/L	5	U	U	NA		
Benzidine	ug/L	10	U	U	NA		
Benzo(a)anthracene	ug/L	5	U	U	NA		
Benzo(a)pyrene	ug/L	5	U	U	NA		
Benzo(b)fluoranthene	ug/L	5	U	U	NA		
Benzo(k)fluoranthene	ug/L	5	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	5	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	5	J B	UB	NA		
Butylbenzylphthalate	ug/L	5	J B	UB	NA		
Chrysene	ug/L	5	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	5	U	U	NA		
Diethylphthalate	ug/L	5	U	U	NA		
Dimethylphthalate	ug/L	5	U	U	NA		
Di-n-Butylphthalate	ug/L	5	J B	UB	NA		
Fluoranthene	ug/L	5	U	U	NA		
Fluorene	ug/L	5	U	U	NA		
Hexachlorobenzene	ug/L	5	U	U	NA		
Hexachlorobutadiene	ug/L	5	U	U	NA		
Hexachlorocyclopentadiene	ug/L	5	U	U	NA		
Hexachloroethane	ug/L	5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - SVOCs

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	5	U	U	NA		
Isophorone	ug/L	5	U	U	NA		
Naphthalene	ug/L	5	U	U	NA		
Nitrobenzene	ug/L	5	U	U	NA		
N-Nitrosodimethylamine	ug/L	10	U	U	NA		
N-Nitrosodiphenylamine	ug/L	5	U	U	NA		
Pentachlorophenol	ug/L	10	U	U	NA		
Phenanthrene	ug/L	5	U	U	NA		
Phenol	ug/L	5	U	U	NA		
Pyrene	ug/L	5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Inorganics

ANALYTE	Units	PRR1WATCME-16	LQ	VQ
Antimony	ug/L	3.8		
Arsenic	ug/L	6.6	*	J
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2.4		
Copper	ug/L	5.3		
Cyanide	ug/L	10	U N	UJ
Lead	ug/L	1.2		UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	19.3	E	J
Selenium	ug/L	15.4	E	J
Silver	ug/L	0.15	J	J
Zinc	ug/L	12.9		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1200 - Miscellaneous

ANALYTE	Units	PRR1WATCME-15	LQ	VQ	PRR1WATCME-16	LQ	VQ
Total Organic Carbon	mg/L	NA			3.6	B	
Total Suspended Solids	mg/L	12.3			6.8		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: RJYQT06.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/06/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/10/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	5.0	U
111-44-4	Bis(2-chloroethyl)ether	5.0	U
95-57-8	2-Chlorophenol	5.0	U
108-60-1	2,2'-Oxybis(1-chloropropane)	5.0	U
67-72-1	Hexachloroethane	5.0	U
98-95-3	Nitrobenzene	5.0	U
78-59-1	Isophorone	5.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
91-20-3	Naphthalene	5.0	U
87-68-3	Hexachlorobutadiene	5.0	U
77-47-4	Hexachlorocyclopentadiene	5.0	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	0.36	J
131-11-3	Dimethylphthalate	5.0	U
606-20-2	2,6-Dinitrotoluene	5.0	U
51-28-5	2,4-Dinitrophenol	10	U
100-02-7	4-Nitrophenol	10	U
121-14-2	2,4-Dinitrotoluene	5.0	U
84-66-2	Diethylphthalate	5.0	U
86-73-7	Fluorene	5.0	U
534-52-1	4,6-Dinitro-2-methylphenol	10	U
86-30-6	N-Nitrosodiphenylamin[1]	5.0	U
118-74-1	Hexachlorobenzene	5.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.0	U
120-12-7	Anthracene	5.0	U
84-74-2	Di-n-butylphthalate	5.0 ~~0.17~~	~~J B~~ UB
206-44-0	Fluoranthene	5.0	U
92-87-5	Benzidine	10	U
129-00-0	Pyrene	5.0	U

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: RJYQT06.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/06/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/10/2012

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
85-68-7	Butylbenzylphthalate	5.0	~~0.31~~	~~J B~~ uB
91-94-1	3,3'-Dichlorobenzidine		5.0	U
56-55-3	Benzo(a)anthracene		5.0	U
218-01-9	Chrysene		5.0	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.0	~~0.66~~	~~J B~~ uB
205-99-2	Benzo(b)fluoranthene		5.0	U
207-08-9	Benzo(k)fluoranthene		5.0	U
50-32-8	Benzo(a)pyrene		5.0	U
193-39-5	Indeno(1,2,3-cd)pyrene		5.0	U
53-70-3	Dibenzo(a,h)anthracene		5.0	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2
Sample wt/vol: 980 (g/mL) mL Lab File ID: RJYQX07.D
Level: (LOW/MED) LOW Extraction: (Type) CONT
% Moisture: Decanted: (Y/N) Date Received: 04/06/2012
Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/06/2012
Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/11/2012
GPC Cleanup: (Y/N) N pH: Dilution Factor: 500.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	24000	
534-52-1	4,6-Dinitro-2-methylphenol	5100	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012
% Moisture: not dec. Date Analyzed: 04/09/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG13.D
Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012
% Moisture: not dec. Date Analyzed: 04/09/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2
Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG18.D
Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012
% Moisture: not dec. Date Analyzed: 04/09/2012
GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 8.8
Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)
Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	87	
87-61-6	1,2,3-Trichlorobenzene	13	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04052012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	2.2	J
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.29	J
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.076	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04052012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/06/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.15	J
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 09AP121545-R051.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q	
319-84-6	alpha-BHC	0.0049	~~0.00065~~	~~J P B~~	UB
319-85-7	beta-BHC	0.0049	~~0.00061~~	~~J P B~~	UB
319-86-8	delta-BHC	0.0049	~~0.00068~~	~~J P B~~	UB
58-89-9	gamma-BHC (Lindane)	0.0049	~~0.000038~~	~~J P~~ U	
76-44-8	Heptachlor	0.0049	~~0.00037~~	~~J P B~~	UB
309-00-2	Aldrin	0.0049	~~0.00024~~	~~J P~~ U	
1024-57-3	Heptachlor epoxide	0.0049	~~0.00016~~	~~J P~~ U	
959-98-8	Endosulfan I		0.00036	J	
60-57-1	Dieldrin	0.0098	~~0.000088~~	~~J P B~~	UB
72-55-9	4,4'-DDE		0.0014	J	
72-20-8	Endrin	0.0098	~~0.00011~~	~~J P~~ U	
33213-65-9	Endosulfan II	0.0098	~~0.00024~~	~~J P~~ U	
72-54-8	4,4'-DDD		0.0082	J	
1031-07-8	Endosulfan sulfate		0.0098	U	
50-29-3	4,4'-DDT	0.0014	~~0.0014~~	~~J P B~~	J
7421-93-4	Endrin aldehyde		0.0098	U	
5103-71-9	alpha-Chlordane		0.0049	U	
5103-74-2	gamma-Chlordane	0.0049	~~0.00024~~	~~J P B~~	UB
8001-35-2	Toxaphene		0.49	U	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10AP121504-R051.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 04/06/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/10/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.0098	U
789-02-6	2,4'-DDT	0.0098 ~~0.0030~~ ~~J P~~ U	
53-19-0	2,4'-DDD	0.0044	J

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1200
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2
Sample wt/vol: 1050 (g/mL) mL Lab File ID: 10AP121504-R081.D
% Moisture: Decanted: (Y/N) Date Received: 04/06/2012
Extraction: (Type) SEPF Date Extracted: 04/06/2012
Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/10/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
3424-82-6	2,4'-DDE	2.1	~~2.2~~	~~E P~~ D JN
53-19-0	2,4'-DDD		0.57	~~P~~ JN
789-02-6	2,4'-DDT		1.1	~~P~~ JN

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 10AP121954-R021.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/10/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	2.1	P D
53-19-0	2,4'-DDD	0.54	P D
789-02-6	2,4'-DDT	0.96	P D

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 09AP122119-R031.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	1.1	~~P~~ D J N

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 09AP121545-R101.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	1.1	E P

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1200

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10232-1

Sample wt/vol: 1030 (g/mL) mL Lab File ID: 09AP121003-R051.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/06/2012

Extraction: (Type) SEPF Date Extracted: 04/06/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/09/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg)ug/L	Q
12674-11-2	Aroclor-1016	0.97	U
11104-28-2	Aroclor-1221	0.97	U
11141-16-5	Aroclor-1232	0.97	U
53469-21-9	Aroclor-1242	0.97	U
12672-29-6	Aroclor-1248	0.97	U
11097-69-1	Aroclor-1254	0.97	U
11096-82-5	Aroclor-1260	0.97	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCME-16 Lab Sample ID: 200-10232-1

Matrix: Water Lab File ID: 12ap121444-r051.d

Analysis Method: 8151A Date Collected: 04/05/2012 13:00

Extraction Method: 8151A Date Extracted: 04/10/2012 09:36

Sample wt/vol: 995(mL) Date Analyzed: 04/12/2012 17:22

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36828 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.7	U	1.7	0.47
88-85-7	Dinoseb	0.95	U *	0.95	0.19
93-76-5	2,4,5-T	0.35	J	0.47	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	75		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCME-16 Lab Sample ID: 200-10232-1

Matrix: Water Lab File ID: 12ap121444-r051.d

Analysis Method: 8151A Date Collected: 04/05/2012 13:00

Extraction Method: 8151A Date Extracted: 04/10/2012 09:36

Sample wt/vol: 995(mL) Date Analyzed: 04/12/2012 17:22

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36828 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.80	J	1.9	0.65

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	78		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCME-16 RE Lab Sample ID: 200-10232-1 RE

Matrix: Water Lab File ID: 16ap121238-r031.d

Analysis Method: 8151A Date Collected: 04/05/2012 13:00

Extraction Method: 8151A Date Extracted: 04/13/2012 10:21

Sample wt/vol: 995(mL) Date Analyzed: 04/16/2012 14:08

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37005 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.90	J H	1.9	0.65
94-82-6	2,4-DB	1.7	U H J	1.7	0.47
88-85-7	Dinoseb	~~0.95~~	~~U H~~ R	~~0.95~~	0.19
93-76-5	2,4,5-T	0.45	J H	0.47	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	89		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10232-2

SDG No.: PRR1200

Client Sample ID: PRR1WATCMI-16 Lab Sample ID: 200-10232-2

Matrix: Water Lab File ID: 12ap121444-r081.d

Analysis Method: 8151A Date Collected: 04/05/2012 12:45

Extraction Method: 8151A Date Extracted: 04/10/2012 09:36

Sample wt/vol: 955(mL) Date Analyzed: 04/12/2012 19:08

Con. Extract Vol.: 10000(uL) Dilution Factor: 10000

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36828 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	34000		4900	1400

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1200
Matrix: WATER Lab Sample Id: 200-10232-1
% Solids: Date Received: 04/06/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.8			MS
7440-38-2	Arsenic	6.6		~~*~~ J	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.4			MS
7440-50-8	Copper	5.3			MS
7439-92-1	Lead	1.2	UB		MS
7440-02-0	Nickel	19.3		~~E~~ J	MS
7782-49-2	Selenium	15.4		~~E~~ J	MS
7440-22-4	Silver	0.15	J		MS
7440-66-6	Zinc	12.9			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1200
Matrix: WATER Lab Sample Id: 200-10232-1
% Solids: Date Received: 04/06/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-16

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1200

Matrix: WATER Lab Sample Id: 200-10232-1

% Solids: Date Received: 04/06/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U	J ~~N~~	AS

Color Before: WHITE Clarity Before: CLOUDY Texture:

Color After: Clarity After: Artifacts:

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-16 | Lab Sample ID: 200-10232-1

Lab Name: TestAmerica Burlington | Job No.: 200-10232-2

SDG ID.: PRR1200

Matrix: Water | Date Sampled: 04/05/2012 13:00

Reporting Basis: WET | Date Received: 04/06/2012 10:10

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	3.6	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-16
Lab Sample ID: 200-10228-1
Lab Name: TestAmerica Burlington
Job No.: 200-10228-1
SDG ID.: PRR1200
Matrix: Water
Date Sampled: 04/05/2012 13:00
Reporting Basis: WET
Date Received: 04/06/2012 10:10

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.8	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-15
Lab Sample ID: 200-10228-2
Lab Name: TestAmerica Burlington
Job No.: 200-10228-1
SDG ID.: PRR1200
Matrix: Water
Date Sampled: 04/04/2012 16:00
Reporting Basis: WET
Date Received: 04/06/2012 10:10

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	12.3	1.9		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
80009964.0002.70004	Tierra Phase I Removal	PRR1200	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-16	4/5/2012	13:00	water	Grab	52	X	X	X	X	X	X	X	X	X	X								
PRR1WATCMI-16	4/5/2012	12:45	water	Grab	9		X	X		X			X										
TB04052012	4/5/2012		water	—	3		X																
PRR1WATCME-15	4/4/2012	16:00	water	Grab	1									X									

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	WET Testing
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

Triple volume collected for MS/MSD for PRR1WATCME-15 (except TSS and WET Testing)

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/5/12	1400	[signature] 4/6/12 1010 TA BUR			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1200 (33696)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17189R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1200 (33696) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1WATCME-16	33696-001	Water	4/05/2012				X		X
PRR1WATCMI-16	33696-002	Water	4/05/2012				X		X

1. PCDD/PCDF by EPA Method 1613.
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in sample PRR1WATCMI-16 and confirmation analysis was performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-16	2,3,7,8-TCDD	63400 E	--	63400 EJ
	OCDD	50200 E	--	50200 EJ
	OCDF	163000 E	--	163000 EJ

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

The laboratory qualified with "P" the total TCDF and total PeCDF results for sample location PRR1WATCMI-16 to indicate that there was possible chlorinated diphenylether interference with the

results. The total TCDF and total PeCDF results for PRR1WATCMI-16 were qualified as estimated maximum possible concentrations (EMPCs).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.
P	The amount reported is the maximum possible concentration due to possible chlorinated diphenylether interference.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The MS/MSD analysis performed on sample location PRR1WATCME-16 exhibited recovery above the control limit for one congener.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

Compounds 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. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis performed on sample location PRR1WATCME-16 exhibited recovery above the control limit for congener PCB-84/92. This congener result is qualified as estimated.

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-16	PCB-209	187000 E	--	187000 EJ

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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory added the qualifier "I" which is defined by the laboratory as "Chemical Interference." These samples results were qualified as estimated (J).

The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: September 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - PCB Congeners

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
PCB-1	pg/L	5.32	U	U	32200		
PCB-2	pg/L	5.32	U	U	8550		
PCB-3	pg/L	5.32	U	U	13100		
PCB-4/10	pg/L	10.6	U	U	11000		
PCB-5/8	pg/L	10.6	U	U	25300		
PCB-6	pg/L	10.6	U	U	5960		
PCB-7/9	pg/L	10.6	U	U	5600		
PCB-11	pg/L	10.6	U	U	6060	B	
PCB-12/13	pg/L	10.6	U	U	9420		
PCB-14	pg/L	10.6	U	U	2860		
PCB-15	pg/L	10.6	U	U	8400		
PCB-16/32	pg/L	58			19700		
PCB-17	pg/L	37.8			13700		
PCB-18	pg/L	93			33600		
PCB-19	pg/L	9.68			3390		
PCB-20/21/33	pg/L	55.1			20700		
PCB-22	pg/L	32.9			11400		
PCB-23	pg/L	5.32	U	U	215		
PCB-24/27	pg/L	7.54			2990		
PCB-25	pg/L	11.8			3350		
PCB-26	pg/L	16.8			4190		
PCB-28	pg/L	92.2			34700		
PCB-29	pg/L	5.32	U	U	413		
PCB-30	pg/L	5.32	U	U	75.9		
PCB-31	pg/L	82.9			32300		
PCB-34	pg/L	5.32	U	U	291		
PCB-35	pg/L	5.32	U	U	889		
PCB-36	pg/L	5.32	U	U	115		
PCB-37	pg/L	18.4			6780		
PCB-38	pg/L	5.32	U	U	459		
PCB-39	pg/L	5.32	U	U	280		
PCB-40	pg/L	31.2			3750		
PCB-41/64/71/72	pg/L	158			17100		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - PCB Congeners

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
PCB-42/59	pg/L	58.9			7380		
PCB-43/49	pg/L	151			18900		
PCB-44	pg/L	179			23400		
PCB-45	pg/L	27.6			4180		
PCB-46	pg/L	13.9			1850		
PCB-47	pg/L	52.7			6200		
PCB-48/75	pg/L	43.1			5640		
PCB-50	pg/L	5.32	U	U	111		
PCB-51	pg/L	12.1			1450		
PCB-52/69	pg/L	190			25000		
PCB-53	pg/L	28.5			4080		
PCB-54	pg/L	5.32	U	U	122		
PCB-55	pg/L	5.32	U	U	407		
PCB-56/60	pg/L	122			14600		
PCB-57	pg/L	5.32	U	U	136		
PCB-58	pg/L	5.32	U	U	63		
PCB-61/70	pg/L	216			24200		
PCB-62	pg/L	5.32	U	U	26.3	U	U
PCB-63	pg/L	8.49			914		
PCB-65	pg/L	5.32	U	U	26.4		
PCB-67	pg/L	8.4			892		
PCB-68	pg/L	5.32	U	U	54.4		
PCB-73	pg/L	5.32	U	U	26.3	U	U
PCB-74	pg/L	101			13400		
PCB-76/66	pg/L	160			21200		
PCB-77	pg/L	18.2			1750		
PCB-78	pg/L	5.32	U	U	26.3	U	U
PCB-79	pg/L	5.32	U	U	309	U,I	UJ
PCB-80	pg/L	5.32	U	U	26.3	U	U
PCB-81	pg/L	4.06	U	U	46.8		
PCB-82	pg/L	42.9			2930		
PCB-83	pg/L	5.32	U	U	24	J	J
PCB-84/92	pg/L	111		J	8510		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - PCB Congeners

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
PCB-85/116	pg/L	54.9			3700		
PCB-86	pg/L	5.32	U	U	232		
PCB-87/117/125	pg/L	100			6950		
PCB-88/91	pg/L	45			3270		
PCB-89	pg/L	5.99			424		
PCB-90/101	pg/L	293			20500		
PCB-93	pg/L	5.32	U	U	26.3	U	U
PCB-94	pg/L	5.32	U	U	179		
PCB-95/98/102	pg/L	207			16200		
PCB-96	pg/L	5.32	U	U	174		
PCB-97	pg/L	92.5			6260		
PCB-99	pg/L	142			9990		
PCB-100	pg/L	5.32	U	U	240		
PCB-103	pg/L	5.32	U	U	222		
PCB-104	pg/L	5.32	U	U	38.2		
PCB-105	pg/L	102			6800		
PCB-106/118	pg/L	292			18600		
PCB-107/109	pg/L	20.4			1200		
PCB-108/112	pg/L	13.5			916		
PCB-110	pg/L	323			22400		
PCB-111/115	pg/L	5.32	U	U	497		
PCB-113	pg/L	5.32	U	U	26.3	U	U
PCB-114	pg/L	11.4			813		
PCB-119	pg/L	7.02			450		
PCB-120	pg/L	5.32	U	U	62		
PCB-121	pg/L	5.32	U	U	26.3	U	U
PCB-122	pg/L	5.32	U	U	233		
PCB-123	pg/L	6.61			376		
PCB-124	pg/L	12.8			737		
PCB-126	pg/L	1.98	U	U	102		
PCB-127	pg/L	5.32	U	U	26.3	U	U
PCB-128/162	pg/L	68.6			2650		
PCB-129	pg/L	20.9			840		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - PCB Congeners

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
PCB-130	pg/L	25.7			1100		
PCB-131	pg/L	5.32	U	U	17.3	J	J
PCB-132/161	pg/L	101			4680		
PCB-133/142	pg/L	10.3			484		
PCB-134/143	pg/L	17.6			862		
PCB-135	pg/L	40.9			1760		
PCB-136	pg/L	43.8			2200		
PCB-137	pg/L	22			899		
PCB-138/163/164	pg/L	397			17000		
PCB-139/149	pg/L	239			11100		
PCB-140	pg/L	5.32	U	U	82.7		
PCB-141	pg/L	81.6			3480		
PCB-144	pg/L	13.8			770		
PCB-145	pg/L	5.32	U	U	11.3	J	J
PCB-146/165	pg/L	51.5			2160		
PCB-147	pg/L	8.58			341		
PCB-148	pg/L	5.32	U	U	33.8		
PCB-150	pg/L	5.32	U	U	42.4		
PCB-151	pg/L	69.2			3260		
PCB-152	pg/L	5.32	U	U	23.2	J	J
PCB-153	pg/L	353			15500		
PCB-154	pg/L	7.11			266		
PCB-155	pg/L	20.9			893		
PCB-156	pg/L	53.6			2170		
PCB-157	pg/L	11.5			433		
PCB-158/160	pg/L	44.9			2000		
PCB-159	pg/L	6.42			26.3	U	U
PCB-166	pg/L	5.32	U	U	249		
PCB-167	pg/L	18.9			785		
PCB-168	pg/L	5.32	U	U	30.6		
PCB-169	pg/L	1.1	U	U	24.2	U,*	U
PCB-170	pg/L	138			3850		
PCB-171	pg/L	34.5			1030		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - PCB Congeners

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
PCB-172	pg/L	21.2			647		
PCB-173	pg/L	5.32	U	U	112		
PCB-174	pg/L	148			4390		
PCB-175	pg/L	7.48			215		
PCB-176	pg/L	21			628		
PCB-177	pg/L	81.6			2410		
PCB-178	pg/L	29.9			897		
PCB-179	pg/L	71			2100		
PCB-180	pg/L	335			9600		
PCB-181	pg/L	5.32	U	U	18.7	J	J
PCB-182/187	pg/L	184			5430		
PCB-183	pg/L	86.5			2480		
PCB-184	pg/L	5.32	U	U	67.4		
PCB-185	pg/L	17.6			564		
PCB-186	pg/L	5.32	U	U	26.3	U	U
PCB-188	pg/L	5.32	U	U	15.2	J	J
PCB-189	pg/L	7.85			276		
PCB-190	pg/L	5.32	U	U	1160	U,I	UJ
PCB-191	pg/L	5.16	J	J	173		
PCB-192	pg/L	5.32	U	U	7.21	J	J
PCB-193	pg/L	13.8			443		
PCB-194	pg/L	94.1			2170		
PCB-195	pg/L	33.6			865		
PCB-196/203	pg/L	133			2830		
PCB-197	pg/L	5.32	U	U	103		
PCB-198	pg/L	6.97			145		
PCB-199	pg/L	114			2610		
PCB-200	pg/L	14.8			351		
PCB-201	pg/L	15.1			354		
PCB-202	pg/L	23			576		
PCB-204	pg/L	5.32	U	U	26.3	U	U
PCB-205	pg/L	5.32	U	U	399	U,I	UJ
PCB-206	pg/L	87.5			2630		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - PCB Congeners

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
PCB-207	pg/L	12.8			332		
PCB-208	pg/L	25.2			670		
PCB-209	pg/L	1670			187000	E	EJ
Total monoCB	pg/L	5.32	U	U	53900		
Total diCB	pg/L	10.6	U	U	74600	B	
Total triCB	pg/L	516			189000		
Total tetraCB	pg/L	1580			197000		
Total pentaCB	pg/L	1880			133000		
Total hexaCB	pg/L	1730			76200		
Total heptaCB	pg/L	1200			35400		
Total octaCB	pg/L	435			10000		
Total nonaCB	pg/L	125			3630		
Total decaCB	pg/L	1670			187000		J
Total PCB	pg/L	9140			960000	B	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1200 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-16	LQ	VQ	PRR1WATCMI-16	LQ	VQ
2,3,7,8-TCDD	pg/L	506			63400	E	EJ
1,2,3,7,8-PeCDD	pg/L	3.51	J	J	255		
1,2,3,4,7,8-HxCDD	pg/L	1	EMPC	EMPC	45.7		
1,2,3,6,7,8-HxCDD	pg/L	7.32	J	J	318		
1,2,3,7,8,9-HxCDD	pg/L	4.3	J	J	141		
1,2,3,4,6,7,8-HpCDD	pg/L	16.1	J	J	720		
OCDD	pg/L	461			50200	E	EJ
Total TCDD	pg/L	552			70200		
Total PeCDD	pg/L	17.5			1730		
Total HxCDD	pg/L	21.1			1120		
Total HpCDD	pg/L	26.7			1150		
2,3,7,8-TCDF	pg/L	1.5	U	U	274		
1,2,3,7,8-PeCDF	pg/L	1.07	U	U	104		
2,3,4,7,8-PeCDF	pg/L	10.6	J	J	732		
1,2,3,4,7,8-HxCDF	pg/L	67.8			3770		
1,2,3,6,7,8-HxCDF	pg/L	12	J	J	595		
1,2,3,7,8,9-HxCDF	pg/L	1.96	EMPC	EMPC	100		
2,3,4,6,7,8-HxCDF	pg/L	6.09	J	J	306		
1,2,3,4,6,7,8-HpCDF	pg/L	174			9380		
1,2,3,4,7,8,9-HpCDF	pg/L	12.6	J	J	597		
OCDF	pg/L	1900			163000	E	EJ
Total TCDF	pg/L	678			102000	P	EMPC
Total PeCDF	pg/L	956			68300	P	EMPC
Total HxCDF	pg/L	181			9830		
Total HpCDF	pg/L	223			12000		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	526			64600		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1WATCME-16 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33696-001	Date Received:	6-Apr-12
Project:	PRR1200	Sample Size:	1.00 L	QC Batch No.:	4358	Date Extracted:	6-Apr-12
Date Collected:	5-Apr-12			Date Analyzed DB-5:	7-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1300						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	506			
1,2,3,7,8-PeCDD	3.51			J
1,2,3,4,7,8-HxCDD	ND		1.00	
1,2,3,6,7,8-HxCDD	7.32			J
1,2,3,7,8,9-HxCDD	4.30			J
1,2,3,4,6,7,8-HpCDD	16.1			J
OCDD	461			
2,3,7,8-TCDF	ND	1.50		
1,2,3,7,8-PeCDF	ND	1.07		
2,3,4,7,8-PeCDF	10.6			J
1,2,3,4,7,8-HxCDF	67.8			
1,2,3,6,7,8-HxCDF	12.0			J
2,3,4,6,7,8-HxCDF	6.09			J
1,2,3,7,8,9-HxCDF	ND		1.96	
1,2,3,4,6,7,8-HpCDF	174			
1,2,3,4,7,8,9-HpCDF	12.6			J
OCDF	1900			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	84.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	91.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	78.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	76.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	76.5	23 - 140	
	13C-OCDD	64.8	17 - 157	
	13C-2,3,7,8-TCDF	85.2	24 - 169	
	13C-1,2,3,7,8-PeCDF	81.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	82.4	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	82.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	75.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	76.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	72.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	74.3	26 - 138	
	13C-OCDF	65.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	

Totals		
Total TCDD	552	
Total PeCDD	17.5	28.1
Total HxCDD	21.1	26.0
Total HpCDD	26.7	
Total TCDF	678	680
Total PeCDF	956	
Total HxCDF	181	189
Total HpCDF	223	228

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 525

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: MAS

Approved By: Calvin Tanaka 11-Apr-2012 12:35

Sample ID: PRR1WATCMI-16 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33696-002	Date Received:	6-Apr-12
Project:	PRR1200	Sample Size:	0.941 L	QC Batch No.:	4358	Date Extracted:	6-Apr-12
Date Collected:	5-Apr-12			Date Analyzed DB-5:	7-Apr-12	Dates Analyzed DB-225:	10-Apr-12
Time Collected:	1245						

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	63400			EJ
1,2,3,7,8-PeCDD	255			
1,2,3,4,7,8-HxCDD	45.7			
1,2,3,6,7,8-HxCDD	318			
1,2,3,7,8,9-HxCDD	141			
1,2,3,4,6,7,8-HpCDD	720			
OCDD	50200			EJ
2,3,7,8-TCDF	274			
1,2,3,7,8-PeCDF	104			
2,3,4,7,8-PeCDF	732			
1,2,3,4,7,8-HxCDF	3770			
1,2,3,6,7,8-HxCDF	595			
2,3,4,6,7,8-HxCDF	306			
1,2,3,7,8,9-HxCDF	100			
1,2,3,4,6,7,8-HpCDF	9380			
1,2,3,4,7,8,9-HpCDF	597			
OCDF	163000			EJ

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	102	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	87.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	87.5	23 - 140	
	13C-OCDD	81.7	17 - 157	
	13C-2,3,7,8-TCDF	91.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	93.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	92.9	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	95.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	86.6	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	86.3	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	89.0	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	87.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	90.3	26 - 138	
	13C-OCDF	88.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	177	35 - 197	

Totals

Total TCDD	70200	
Total PeCDD	1730	
Total HxCDD	1120	
Total HpCDD	1150	
Total TCDF	102000	102000EMPC ~~P~~
Total PeCDF	68300	EMPC ~~P~~
Total HxCDF	9830	
Total HpCDF	12000	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 64600

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: MAS

Approved By: Calvin Tanaka 11-Apr-2012 12:35

Sample ID:	PRR1WATCME-16		EPA Method 1668A
Client Data	**Sample Data**	**Laboratory Data**	
Name: ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33696-001	Date Received: 6-Apr-12
Project: PRR1200	Sample Size: 0.940 L	QC Batch No.: 4359	Date Extracted: 6-Apr-12
Date Collected: 5-Apr-12	%Solids: 1.18	Date Analyzed DB-1 6-Apr-12	
Time Collected: 1300			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	ND	5.32	
PCB-2	ND	5.32	
PCB-3	ND	5.32	
PCB-4/10	ND	10.6	
PCB-5/8	ND	10.6	
PCB-6	ND	10.6	
PCB-7/9	ND	10.6	
PCB-11	ND	10.6	
PCB-12/13	ND	10.6	
PCB-14	ND	10.6	
PCB-15	ND	10.6	
PCB-16/32	58.0	5.32	
PCB-17	37.8	5.32	
PCB-18	93.0	5.32	
PCB-19	9.68	5.32	
PCB-20/21/33	55.1	5.32	
PCB-22	32.9	5.32	
PCB-23	ND	5.32	
PCB-24/27	7.54	5.32	
PCB-25	11.8	5.32	
PCB-26	16.8	5.32	
PCB-28	92.2	5.32	
PCB-29	ND	5.32	
PCB-30	ND	5.32	
PCB-31	82.9	5.32	
PCB-34	ND	5.32	
PCB-35	ND	5.32	
PCB-36	ND	5.32	
PCB-37	18.4	5.32	
PCB-38	ND	5.32	
PCB-39	ND	5.32	
PCB-40	31.2	5.32	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	158	5.32	
PCB-42/59	58.9	5.32	
PCB-43/49	151	5.32	
PCB-44	179	5.32	
PCB-45	27.6	5.32	
PCB-46	13.9	5.32	
PCB-47	52.7	5.32	
PCB-48/75	43.1	5.32	
PCB-50	ND	5.32	
PCB-51	12.1	5.32	
PCB-52/69	190	5.32	
PCB-53	28.5	5.32	
PCB-54	ND	5.32	
PCB-55	ND	5.32	
PCB-56/60	122	5.32	
PCB-57	ND	5.32	
PCB-58	ND	5.32	
PCB-61/70	216	5.32	
PCB-62	ND	5.32	
PCB-63	8.49	5.32	
PCB-65	ND	5.32	
PCB-67	8.40	5.32	
PCB-68	ND	5.32	
PCB-73	ND	5.32	
PCB-74	101	5.32	
PCB-76/66	160	5.32	
PCB-77	18.2	5.32	
PCB-78	ND	5.32	
PCB-79	ND	5.32	
PCB-80	ND	5.32	
PCB-81	ND	4.06	
PCB-82	42.9	5.32	

Sample ID:	PRR1WATCME-16			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33696-001	Date Received: 6-Apr-12
Project:	PRR1200	Sample Size: 0.940 L	QC Batch No.: 4359	Date Extracted: 6-Apr-12
Date Collected:	5-Apr-12	%Solids: 1.18	Date Analyzed DB-1 6-Apr-12	
Time Collected:	1300			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	5.32	
PCB-84/92	111	5.32	J
PCB-85/116	54.9	5.32	
PCB-86	ND	5.32	
PCB-87/117/125	100	5.32	
PCB-88/91	45.0	5.32	
PCB-89	5.99	5.32	
PCB-90/101	293	5.32	
PCB-93	ND	5.32	
PCB-94	ND	5.32	
PCB-95/98/102	207	5.32	
PCB-96	ND	5.32	
PCB-97	92.5	5.32	
PCB-99	142	5.32	
PCB-100	ND	5.32	
PCB-103	ND	5.32	
PCB-104	ND	5.32	
PCB-105	102	5.32	
PCB-106/118	292	5.32	
PCB-107/109	20.4	5.32	
PCB-108/112	13.5	5.32	
PCB-110	323	5.32	
PCB-111/115	ND	5.32	
PCB-113	ND	5.32	
PCB-114	11.4	5.32	
PCB-119	7.02	5.32	
PCB-120	ND	5.32	
PCB-121	ND	5.32	
PCB-122	ND	5.32	
PCB-123	6.61	5.32	
PCB-124	12.8	5.32	
PCB-126	ND	1.98	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	5.32	
PCB-128/162	68.6	5.32	
PCB-129	20.9	5.32	
PCB-130	25.7	5.32	
PCB-131	ND	5.32	
PCB-132/161	101	5.32	
PCB-133/142	10.3	5.32	
PCB-134/143	17.6	5.32	
PCB-135	40.9	5.32	
PCB-136	43.8	5.32	
PCB-137	22.0	5.32	
PCB-138/163/164	397	5.32	
PCB-139/149	239	5.32	
PCB-140	ND	5.32	
PCB-141	81.6	5.32	
PCB-144	13.8	5.32	
PCB-145	ND	5.32	
PCB-146/165	51.5	5.32	
PCB-147	8.58	5.32	
PCB-148	ND	5.32	
PCB-150	ND	5.32	
PCB-151	69.2	5.32	
PCB-152	ND	5.32	
PCB-153	353	5.32	
PCB-154	7.11	5.32	
PCB-155	20.9	5.32	
PCB-156	53.6	5.32	
PCB-157	11.5	5.32	
PCB-158/160	44.9	5.32	
PCB-159	6.42	5.32	
PCB-166	ND	5.32	
PCB-167	18.9	5.32	

Sample ID:	PRR1WATCME-16		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33696-001
Project:	PRR1200	Sample Size: 0.940 L	QC Batch No.: 4359
Date Collected:	5-Apr-12	%Solids: 1.18	Date Analyzed DB-1 6-Apr-12
Time Collected:	1300		Date Received: 6-Apr-12
			Date Extracted: 6-Apr-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	5.32	
PCB-169	ND	1.10	
PCB-170	138	5.32	
PCB-171	34.5	5.32	
PCB-172	21.2	5.32	
PCB-173	ND	5.32	
PCB-174	148	5.32	
PCB-175	7.48	5.32	
PCB-176	21.0	5.32	
PCB-177	81.6	5.32	
PCB-178	29.9	5.32	
PCB-179	71.0	5.32	
PCB-180	335	5.32	
PCB-181	ND	5.32	
PCB-182/187	184	5.32	
PCB-183	86.5	5.32	
PCB-184	ND	5.32	
PCB-185	17.6	5.32	
PCB-186	ND	5.32	
PCB-188	ND	5.32	
PCB-189	7.85	5.32	
PCB-190	ND	5.32	
PCB-191	5.16	5.32	J
PCB-192	ND	5.32	
PCB-193	13.8	5.32	
PCB-194	94.1	5.32	
PCB-195	33.6	5.32	
PCB-196/203	133	5.32	
PCB-197	ND	5.32	
PCB-198	6.97	5.32	
PCB-199	114	5.32	
PCB-200	14.8	5.32	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	15.1	5.32	
PCB-202	23.0	5.32	
PCB-204	ND	5.32	
PCB-205	ND	5.32	
PCB-206	87.5	5.32	
PCB-207	12.8	5.32	
PCB-208	25.2	5.32	
PCB-209	1670	5.32	
Total monoCB	ND	5.32	
Total diCB	ND	10.6	
Total triCB	516	5.32	
Total tetraCB	1580	5.32	
Total pentaCB	1880	5.32	
Total hexaCB	1730	5.32	
Total heptaCB	1200	5.32	
Total octaCB	435	5.32	
Total nonaCB	125	5.32	
Total decaCB	1670	5.32	
Total PCB	9140	10.6	

TEQ(WHO-2005 Mammal [(Min)]: 0.0169

Sample ID:	PRR1WATCMI-16			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33696-002	Date Received: 6-Apr-12
Project:	PRR1200	Sample Size: 0.951 L	QC Batch No.: 4359	Date Extracted: 6-Apr-12
Date Collected:	5-Apr-12	%Solids: 1.20	Date Analyzed DB-1 10-Apr-12	
Time Collected:	1245			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	32200	26.3	
PCB-2	8550	26.3	
PCB-3	13100	26.3	
PCB-4/10	11000	52.6	
PCB-5/8	25300	52.6	
PCB-6	5960	52.6	
PCB-7/9	5600	52.6	
PCB-11	6060	52.6	B
PCB-12/13	9420	52.6	
PCB-14	2860	52.6	
PCB-15	8400	52.6	
PCB-16/32	19700	26.3	
PCB-17	13700	26.3	
PCB-18	33600	26.3	
PCB-19	3390	26.3	
PCB-20/21/33	20700	26.3	
PCB-22	11400	26.3	
PCB-23	215	26.3	
PCB-24/27	2990	26.3	
PCB-25	3350	26.3	
PCB-26	4190	26.3	
PCB-28	34700	26.3	
PCB-29	413	26.3	
PCB-30	75.9	26.3	
PCB-31	32300	26.3	
PCB-34	291	26.3	
PCB-35	889	26.3	
PCB-36	115	26.3	
PCB-37	6780	26.3	
PCB-38	459	26.3	
PCB-39	280	26.3	
PCB-40	3750	26.3	
PCB-41/64/71/72	17100	26.3	
PCB-42/59	7380	26.3	
PCB-43/49	18900	26.3	
PCB-44	23400	26.3	
PCB-45	4180	26.3	
PCB-46	1850	26.3	
PCB-47	6200	26.3	
PCB-48/75	5640	26.3	
PCB-50	111	26.3	
PCB-51	1450	26.3	
PCB-52/69	25000	26.3	
PCB-53	4080	26.3	
PCB-54	122	26.3	
PCB-55	407	26.3	
PCB-56/60	14600	26.3	
PCB-57	136	26.3	
PCB-58	63.0	26.3	
PCB-61/70	24200	26.3	
PCB-62	ND	26.3	
PCB-63	914	26.3	
PCB-65	26.4	26.3	
PCB-67	892	26.3	
PCB-68	54.4	26.3	
PCB-73	ND	26.3	
PCB-74	13400	26.3	
PCB-76/66	21200	26.3	
PCB-77	1750	26.3	
PCB-78	ND	26.3	
PCB-79	ND	309	~~I~~ J
PCB-80	ND	26.3	
PCB-81	46.8	26.3	
PCB-82	2930	26.3	

Sample ID:	PRR1WATCMI-16			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33696-002	Date Received: 6-Apr-12
Project:	PRR1200	Sample Size: 0.951 L	QC Batch No.: 4359	Date Extracted: 6-Apr-12
Date Collected:	5-Apr-12	%Solids: 1.20	Date Analyzed DB-1 10-Apr-12	
Time Collected:	1245			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	24.0	26.3	J
PCB-84/92	8510	26.3	
PCB-85/116	3700	26.3	
PCB-86	232	26.3	
PCB-87/117/125	6950	26.3	
PCB-88/91	3270	26.3	
PCB-89	424	26.3	
PCB-90/101	20500	26.3	
PCB-93	ND	26.3	
PCB-94	179	26.3	
PCB-95/98/102	16200	26.3	
PCB-96	174	26.3	
PCB-97	6260	26.3	
PCB-99	9990	26.3	
PCB-100	240	26.3	
PCB-103	222	26.3	
PCB-104	38.2	26.3	
PCB-105	6800	26.3	
PCB-106/118	18600	26.3	
PCB-107/109	1200	26.3	
PCB-108/112	916	26.3	
PCB-110	22400	26.3	
PCB-111/115	497	26.3	
PCB-113	ND	26.3	
PCB-114	813	26.3	
PCB-119	450	26.3	
PCB-120	62.0	26.3	
PCB-121	ND	26.3	
PCB-122	233	26.3	
PCB-123	376	26.3	
PCB-124	737	26.3	
PCB-126	102	26.3	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	26.3	
PCB-128/162	2650	26.3	
PCB-129	840	26.3	
PCB-130	1100	26.3	
PCB-131	17.3	26.3	J
PCB-132/161	4680	26.3	
PCB-133/142	484	26.3	
PCB-134/143	862	26.3	
PCB-135	1760	26.3	
PCB-136	2200	26.3	
PCB-137	899	26.3	
PCB-138/163/164	17000	26.3	
PCB-139/149	11100	26.3	
PCB-140	82.7	26.3	
PCB-141	3480	26.3	
PCB-144	770	26.3	
PCB-145	11.3	26.3	J
PCB-146/165	2160	26.3	
PCB-147	341	26.3	
PCB-148	33.8	26.3	
PCB-150	42.4	26.3	
PCB-151	3260	26.3	
PCB-152	23.2	26.3	J
PCB-153	15500	26.3	
PCB-154	266	26.3	
PCB-155	893	26.3	
PCB-156	2170	26.3	
PCB-157	433	26.3	
PCB-158/160	2000	26.3	
PCB-159	ND	26.3	
PCB-166	249	26.3	
PCB-167	785	26.3	

Sample ID:	PRR1WATCMI-16		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33696-002
Project:	PRR1200	Sample Size: 0.951 L	QC Batch No.: 4359
Date Collected:	5-Apr-12	%Solids: 1.20	Date Analyzed DB-1 10-Apr-12
Time Collected:	1245		Date Received: 6-Apr-12
			Date Extracted: 6-Apr-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	30.6	26.3	
PCB-169	ND	24.2	~~*~~
PCB-170	3850	26.3	
PCB-171	1030	26.3	
PCB-172	647	26.3	
PCB-173	112	26.3	
PCB-174	4390	26.3	
PCB-175	215	26.3	
PCB-176	628	26.3	
PCB-177	2410	26.3	
PCB-178	897	26.3	
PCB-179	2100	26.3	
PCB-180	9600	26.3	
PCB-181	18.7	26.3	J
PCB-182/187	5430	26.3	
PCB-183	2480	26.3	
PCB-184	67.4	26.3	
PCB-185	564	26.3	
PCB-186	ND	26.3	
PCB-188	15.2	26.3	J
PCB-189	276	26.3	
PCB-190	ND	1160	~~I~~ J
PCB-191	173	26.3	
PCB-192	7.21	26.3	J
PCB-193	443	26.3	
PCB-194	2170	26.3	
PCB-195	865	26.3	
PCB-196/203	2830	26.3	
PCB-197	103	26.3	
PCB-198	145	26.3	
PCB-199	2610	26.3	
PCB-200	351	26.3	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	354	26.3	
PCB-202	576	26.3	
PCB-204	ND	26.3	
PCB-205	ND	399	~~I~~ J
PCB-206	2630	26.3	
PCB-207	332	26.3	
PCB-208	670	26.3	
PCB-209	187000	26.3	E J
Total monoCB	53900	26.3	
Total diCB	74600	52.6	~~B~~
Total triCB	189000	26.3	
Total tetraCB	197000	26.3	
Total pentaCB	133000	26.3	
Total hexaCB	76200	26.3	
Total heptaCB	35400	26.3	
Total octaCB	10000	26.3	
Total nonaCB	3630	26.3	
Total decaCB	187000	26.3	J
Total PCB	960000	52.6	~~B~~ J

TEQ(WHO-2005 Mammal [(Min)]: **11.3**

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Syracuse, NY 13214
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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33696 3.2°C, 2.4°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1200	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-16	4/5/2012	13:00	water	Grab	12	X	X																
PRR1WATCMI-16	4/5/2012	12:45	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples
Triple volume collected for MS/MSD for PRR1WATCME-15

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA
Shipping Tracking #
Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice
☐ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/5/2012	1400	Kathria Remedios 4/6/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analysis

SDG# PRR1354 (33952)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17201R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1354 (33952) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1SOLPC-15	33952-001	Soil	8/21/2012						X

1. PCDD/PCDF by EPA Method 1613.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Compounds were detected at concentrations greater than the PQL in the method blank. This compound was detected in the sample at a concentration less than five times (ten times for OCDD/OCDF) the method blank concentration (blank action limit BAL). See Section 2.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations greater than the RL for OCDD. This compound's concentration in the sample was less than ten times that of the method blank. The OCDD result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

6. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

7. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
Q	Estimated maximum possible concentration (EMPC)
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.
I	The laboratory indicated the presence of an interference during the sample analysis.

8. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin, Project Scientist

SIGNATURE: 

DATE: September 11, 2012

PEER REVIEW: Joseph C. Houser

DATE: September 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1354 - Dioxins/Furans

ANALYTE	Units	PRR1SOLPC-15	LQ	VQ
2,3,7,8-TCDD	pg/g	0.111	J	J
1,2,3,7,8-PeCDD	pg/g	0.0817	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.145	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.151	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.176	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.159	J	J
OCDD	pg/g	5	J,B	UB
Total TCDD	pg/g	1.06		
Total PeCDD	pg/g	0.0817	U	U
Total HxCDD	pg/g	0.157	U	U
Total HpCDD	pg/g	0.366		
2,3,7,8-TCDF	pg/g	0.0696	U	U
1,2,3,7,8-PeCDF	pg/g	0.108	U	U
2,3,4,7,8-PeCDF	pg/g	0.107	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.161	J	J
1,2,3,6,7,8-HxCDF	pg/g	0.0974	J	J
1,2,3,7,8,9-HxCDF	pg/g	0.0814	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.0578	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.804	J	J
1,2,3,4,7,8,9-HpCDF	pg/g	0.125	U	U
OCDF	pg/g	1.25	J	J
Total TCDF	pg/g	0.0864		
Total PeCDF	pg/g	0.146		
Total HxCDF	pg/g	0.555		
Total HpCDF	pg/g	0.804		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.241		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLPC-15 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33952-001	Date Received:	22-Aug-12
Project:	PRR1354	Sample Size:	10.7 g	QC Batch No.:	4656	Date Extracted:	5-Sep-12
Date Collected:	21-Aug-12	%Solids:	97.2	Date Analyzed DB-5:	6-Sep-12	Date Analyzed DB-225:	NA
Time Collected:	0000						

Analyte	Conc. (pg/g)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	0.111			J
1,2,3,7,8-PeCDD	ND	0.0817		
1,2,3,4,7,8-HxCDD	ND	0.145		
1,2,3,6,7,8-HxCDD	ND	0.151		
1,2,3,7,8,9-HxCDD	ND	0.176		
1,2,3,4,6,7,8-HpCDD	0.159			J
OCDD	~~1.13~~ 5.0			UR ~~J,B~~
2,3,7,8-TCDF	ND	0.0696		
1,2,3,7,8-PeCDF	ND	0.108		
2,3,4,7,8-PeCDF	ND	0.107		
1,2,3,4,7,8-HxCDF	0.161			J
1,2,3,6,7,8-HxCDF	0.0974			J
2,3,4,6,7,8-HxCDF	ND	0.0578		
1,2,3,7,8,9-HxCDF	ND	0.0814		
1,2,3,4,6,7,8-HpCDF	0.804			J
1,2,3,4,7,8,9-HpCDF	ND	0.125		
OCDF	1.25			J

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	95.4	25 - 164	
	13C-1,2,3,7,8-PeCDD	100	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	79.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	101	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	92.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	88.3	23 - 140	
	13C-OCDD	82.9	17 - 157	
	13C-2,3,7,8-TCDF	93.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	112	24 - 185	
	13C-2,3,4,7,8-PeCDF	112	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	81.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	96.0	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	92.3	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	81.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	85.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	78.3	26 - 138	
	13C-OCDF	76.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	83.9	35 - 197	

Totals

Total TCDD	1.06		
Total PeCDD	ND	0.0817	
Total HxCDD	ND	0.157	
Total HpCDD	0.366		
Total TCDF	0.0864		
Total PeCDF	0.146		0.269
Total HxCDF	0.555		
Total HpCDF	0.804		

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 0.147

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: DMS

Approved By: Martha M. Maier 07-Sep-2012 09:38

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33952 0.2°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1354	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLPC-15	8/21/2012		soil	Grab	4	X																	perform MS/MSD

Requested Analyses	
1	Dioxins (PCDD/PCDFs)
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

1 extra 4 oz jar submitted in case of sample breakage. Perform MS/MSD on PRR1SOLPC-15

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 14 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
NA	08/21/2012	1600	Bethany Beaudet 8/22/12 0904			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Waste Characterization QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile Analysis

SDG# WC03 (200-10545)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17202R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # WC03 (200-10545) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB	MET	MISC
PRR1WCCS-04	200-10545-1	Soil	4/26/2012		X				
TB04262012	200-10545-2	Water	4/26/2012		X				

1. Volatiles by USEPA SOM0.1.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Accuracy/Bias – Compounds were detected at concentrations less than the PQL in the method blank and trip blank. Some of these compounds were detected in the sample at concentrations less than (and greater than) five times the method blank concentration (blank action limit BAL). See section 2.

Accuracy/Bias – One surrogate exhibited elevated recoveries in the sample location PRR1WCCS-04. Therefore, positive results for the affected compounds indicate potential high bias.

The cooler temperature upon receipt was outside the method guidelines at 7.8^0C. However, samples were packed on ice and received by laboratory the same day as they were collected. Therefore, none of the data were qualified due to temperature deviations.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Compounds were detected in sample PRR1WCCS-04 at concentrations greater than five times the concentration in the method blank. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). Carbon disulfide was detected in the method blank below the PQL. This compound was detected in sample location PRR1WCCS-04 at concentration less than five times the method blank concentration; therefore, carbon disulfide in the sample is most likely from laboratory contamination. The sample results are reported at the detected sample concentration and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WCCS-04	Vinyl chloride-d3	AC
	Chloroethane-d5	> UL
	1.1-Dichloroethene-d2	AC
	2-Butanone-d5	AC
	Chloroform-d	AC
	1,2-Dichloroethane-d4	AC
	Benzene-d6	AC
	1,2-Dichloropropane	AC
	Toluene-d8	AC
	trans-1,3-Dichloropopene-d4	AC
	2-Hexanone-d5	AC
	1,4-Dioxane-d8	AC
	1,1,2,2-Tetrachloroethane-d2	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 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

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Waste Characterization Quality Assurance Project Plan.

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
PRR1WCCS-04	Chloroform	270000 E	250000 D	250000 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

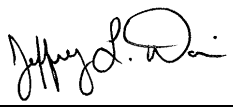
The laboratory qualifiers and their stated definitions provided below will be used by the laboratories exclusively when reporting sample results for the QAPP.

Qualifier	Description
B	Organics – The associated analyte was also detected in the method blank.
D	The organic analyte was quantitated from a diluted analysis.
E	Organics – The associated compound concentration exceeded the calibration range of the instrument.
J	Organic data indicated the presence of a compound that meets the identification critieria; the result is below the PQL but above the method detection limit (MDL).
U	The analyte was analyzed for, but was not detected above the report sample quantitation limit.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: September 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: September 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
UPF Soil Characterization - WC QAPP
Test America
WC03 - VOCs

ANALYTE	Units	PRR1WCCS-04	LQ	VQ
1,1,1-Trichloroethane	ug/kg	4900	U	U
1,1,2,2-Tetrachloroethane	ug/kg	4900	U	U
1,1,2-trichloro-1,2,2-trifluoroethane	ug/kg	4900	U	U
1,1,2-Trichloroethane	ug/kg	4900	U	U
1,1-Dichloroethane	ug/kg	4900	U	U
1,1-Dichloroethene	ug/kg	4900	U	U
1,2,3-Trichlorobenzene	ug/kg	18000	B	
1,2,4-Trichlorobenzene	ug/kg	130000	B	
1,2-Dibromo-3-chloropropane	ug/kg	4900	U	U
1,2-Dibromoethane	ug/kg	4900	U	U
1,2-Dichlorobenzene	ug/kg	42000		
1,2-Dichloroethane	ug/kg	4900	U	U
1,2-Dichloropropane	ug/kg	4900	U	U
1,3-Dichlorobenzene	ug/kg	1700	J	J
1,4-Dichlorobenzene	ug/kg	82000		
1,4-Dioxane	ug/kg	97000	U	U
2-Butanone	ug/kg	9700	U	U
2-Hexanone	ug/kg	9700	U	U
4-Methyl-2-pentanone	ug/kg	9700	U	U
Acetone	ug/kg	9700	U	U
Benzene	ug/kg	4900	U	U
Bromochloromethane	ug/kg	4900	U	U
Bromodichloromethane	ug/kg	4900	U	U
Bromoform	ug/kg	4900	U	U
Bromomethane	ug/kg	4900	U	U
Carbon Disulfide	ug/kg	4900	J B	UB
Carbon Tetrachloride	ug/kg	4900	U	U
Chlorobenzene	ug/kg	150000		
Chloroethane	ug/kg	4900	U	U
Chloroform	ug/kg	250000	D	D
Chloromethane	ug/kg	660	J	J
cis-1,2-Dichloroethene	ug/kg	4900	U	U
cis-1,3-Dichloropropene	ug/kg	4900	U	U

Verification Validation Data Table
UPF Soil Characterization - WC QAPP
Test America
WC03 - VOCs

ANALYTE	Units	PRR1WCCS-04	LQ	VQ
Cyclohexane	ug/kg	4900	U	U
Dibromochloromethane	ug/kg	4900	U	U
Dichlorodifluoromethane	ug/kg	4900	U	U
Ethylbenzene	ug/kg	170	J	J
Isopropylbenzene	ug/kg	4900	U	U
m&p-Xylene	ug/kg	540	J	J
Methyl acetate	ug/kg	71000		
Methyl tert-butyl ether	ug/kg	4900	U	U
Methylcyclohexane	ug/kg	4900	U	U
Methylene Chloride	ug/kg	400	J	J
o-Xylene	ug/kg	320	J	J
Styrene	ug/kg	4900	U	U
Tetrachloroethene	ug/kg	2600	J B	J
Toluene	ug/kg	840	J	J
trans-1,2-Dichloroethene	ug/kg	4900	U	U
trans-1,3-Dichloropropene	ug/kg	4900	U	U
Trichloroethene	ug/kg	630	J	J
Trichlorofluoromethane	ug/kg	4900	U	U
Vinyl Chloride	ug/kg	4900	U	U

SAMPLE ANALYSIS DATA SHEETS AND COCs

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: WC03

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10545-1

Sample wt/vol: 449 (g/mL) g Lab File ID: NFVC07.D

Level: (TRACE/LOW/MED) MED Date Received: 04/26/2012

% Moisture: not dec. 32 Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: 450000 (uL) Soil Aliquot Volume: 100 (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-71-8	Dichlorodifluoromethane	4900	U
74-87-3	Chloromethane	660	J
75-01-4	Vinyl chloride	4900	U
74-83-9	Bromomethane	4900	U
75-00-3	Chloroethane	4900	U
75-69-4	Trichlorofluoromethane	4900	U
75-35-4	1,1-Dichloroethene	4900	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	4900	U
67-64-1	Acetone	9700	U
75-15-0	Carbon disulfide	4900 ~~390~~	~~J B~~ UB
79-20-9	Methyl acetate	71000	
75-09-2	Methylene chloride	400	J
156-60-5	trans-1,2-Dichloroethene	4900	U
1634-04-4	Methyl tert-butyl ether	4900	U
75-34-3	1,1-Dichloroethane	4900	U
156-59-2	cis-1,2-Dichloroethene	4900	U
78-93-3	2-Butanone	9700	U
74-97-5	Bromochloromethane	4900	U
67-66-3	Chloroform	250000 ~~270000~~	~~E~~ D
71-55-6	1,1,1-Trichloroethane	4900	U
110-82-7	Cyclohexane	4900	U
56-23-5	Carbon tetrachloride	4900	U
71-43-2	Benzene	4900	U
107-06-2	1,2-Dichloroethane	4900	U
123-91-1	1,4-Dioxane	97000	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: WC03

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10545-1

Sample wt/vol: 449 (g/mL) g Lab File ID: NFVC07.D

Level: (TRACE/LOW/MED) MED Date Received: 04/26/2012

% Moisture: not dec. 32 Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume: 450000 (uL) Soil Aliquot Volume: 100 (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
79-01-6	Trichloroethene	630	J
108-87-2	Methylcyclohexane	4900	U
78-87-5	1,2-Dichloropropane	4900	U
75-27-4	Bromodichloromethane	4900	U
10061-01-5	cis-1,3-Dichloropropene	4900	U
108-10-1	4-Methyl-2-pentanone	9700	U
108-88-3	Toluene	840	J
10061-02-6	trans-1,3-Dichloropropene	4900	U
79-00-5	1,1,2-Trichloroethane	4900	U
127-18-4	Tetrachloroethene	2600	J B
591-78-6	2-Hexanone	9700	U
124-48-1	Dibromochloromethane	4900	U
106-93-4	1,2-Dibromoethane	4900	U
108-90-7	Chlorobenzene	150000	
100-41-4	Ethylbenzene	170	J
95-47-6	o-Xylene	320	J
179601-23-1	m,p-Xylene	540	J
100-42-5	Styrene	4900	U
75-25-2	Bromoform	4900	U
98-82-8	Isopropylbenzene	4900	U
79-34-5	1,1,2,2-Tetrachloroethane	4900	U
541-73-1	1,3-Dichlorobenzene	1700	J
106-46-7	1,4-Dichlorobenzene	82000	
95-50-1	1,2-Dichlorobenzene	42000	
96-12-8	1,2-Dibromo-3-chloropropane	4900	U
120-82-1	1,2,4-Trichlorobenzene	130000	B
87-61-6	1,2,3-Trichlorobenzene	18000	B

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WCCS-04DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: WC03

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10545-1

Sample wt/vol: 449 (g/mL) g Lab File ID: NFVC06.D

Level: (TRACE/LOW/MED) MED Date Received: 04/26/2012

% Moisture: not dec. 32 Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 25.1

Soil Extract Volume: 450000 (uL) Soil Aliquot Volume: 100 (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-71-8	Dichlorodifluoromethane	12000	U
74-87-3	Chloromethane	1400	J D
75-01-4	Vinyl chloride	12000	U
74-83-9	Bromomethane	12000	U
75-00-3	Chloroethane	12000	U
75-69-4	Trichlorofluoromethane	12000	U
75-35-4	1,1-Dichloroethene	12000	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	12000	U
67-64-1	Acetone	24000	U
75-15-0	Carbon disulfide	1800	J D B
79-20-9	Methyl acetate	73000	D
75-09-2	Methylene chloride	1200	J D
156-60-5	trans-1,2-Dichloroethene	870	J D
1634-04-4	Methyl tert-butyl ether	12000	U
75-34-3	1,1-Dichloroethane	12000	U
156-59-2	cis-1,2-Dichloroethene	12000	U
78-93-3	2-Butanone	24000	U
74-97-5	Bromochloromethane	12000	U
67-66-3	Chloroform	250000	D
71-55-6	1,1,1-Trichloroethane	12000	U
110-82-7	Cyclohexane	12000	U
56-23-5	Carbon tetrachloride	12000	U
71-43-2	Benzene	12000	U
107-06-2	1,2-Dichloroethane	12000	U
123-91-1	1,4-Dioxane	240000	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: WC03

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10545-1

Sample wt/vol: 449 (g/mL) g Lab File ID: NFVC06.D

Level: (TRACE/LOW/MED) MED Date Received: 04/26/2012

% Moisture: not dec. 32 Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 25.1

Soil Extract Volume: 450000 (uL) Soil Aliquot Volume: 100 (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
79-01-6	Trichloroethene	1200	J D
108-87-2	Methylcyclohexane	12000	U
78-87-5	1,2-Dichloropropane	12000	U
75-27-4	Bromodichloromethane	12000	U
10061-01-5	cis-1,3-Dichloropropene	12000	U
108-10-1	4-Methyl-2-pentanone	24000	U
108-88-3	Toluene	990	J D
10061-02-6	trans-1,3-Dichloropropene	12000	U
79-00-5	1,1,2-Trichloroethane	12000	U
127-18-4	Tetrachloroethene	2800	J D B
591-78-6	2-Hexanone	24000	U
124-48-1	Dibromochloromethane	12000	U
106-93-4	1,2-Dibromoethane	12000	U
108-90-7	Chlorobenzene	140000	D
100-41-4	Ethylbenzene	350	J D
95-47-6	o-Xylene	330	J D
179601-23-1	m,p-Xylene	690	J D
100-42-5	Styrene	210	J D
75-25-2	Bromoform	12000	U
98-82-8	Isopropylbenzene	12000	U
79-34-5	1,1,2,2-Tetrachloroethane	12000	U
541-73-1	1,3-Dichlorobenzene	2000	J D
106-46-7	1,4-Dichlorobenzene	80000	D
95-50-1	1,2-Dichlorobenzene	41000	D
96-12-8	1,2-Dibromo-3-chloropropane	12000	U
120-82-1	1,2,4-Trichlorobenzene	130000	D B
87-61-6	1,2,3-Trichlorobenzene	19000	D B

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04262012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: WC03

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10545-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U
67-64-1	Acetone	1.4	J
75-15-0	Carbon disulfide	0.50	U
79-20-9	Methyl acetate	0.50	U
75-09-2	Methylene chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
1634-04-4	Methyl tert-butyl ether	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
78-93-3	2-Butanone	5.0	U
74-97-5	Bromochloromethane	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
110-82-7	Cyclohexane	0.50	U
56-23-5	Carbon tetrachloride	0.017	J
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB04262012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: WC03

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10545-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	0.50	U
108-87-2	Methylcyclohexane	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-10-1	4-Methyl-2-pentanone	5.0	U
108-88-3	Toluene	0.014	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
591-78-6	2-Hexanone	5.0	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
108-90-7	Chlorobenzene	0.12	J
100-41-4	Ethylbenzene	0.0038	J
95-47-6	o-Xylene	0.50	U
179601-23-1	m,p-Xylene	0.013	J
100-42-5	Styrene	0.50	U
75-25-2	Bromoform	0.50	U
98-82-8	Isopropylbenzene	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.021	J
95-50-1	1,2-Dichlorobenzene	0.50	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Waste Characterization Quality Assurance Project Plan - Phase I Removal Action	WC03	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
PRR1WCCS-04	4/26/2012	11:35	Solid	Composite	2	X	X																			
TB04262012	4/26/2012	—	Water	GRAB	3	X																				

Requested Analyses

1	VOCs
2	moisture content
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Special Instructions/Comments:

Please use procedure as per 4/26 conference call between TA Burlington and ARCADIS

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica - Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: RUSH TAT (24 hr if possible) for PRR1WCCS-04. Trip Blank should be run on standard TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
[signature]	4/26/12	2125	[signature]				

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1203 (200-10260)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17207R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1203 (200-10260) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-06	200-10260-1	Water	4/6/2012		X				X
PRR1WATGACE-06	200-10260-2	Water	4/6/2012		X				X
TB04062012	200-10260-3	Water	4/6/2012		X				
PRR1WATCME-17	200-10260-4	Water	4/6/2012						X
PRRWATSP101-5	200-10260-5	Water	4/6/2012						X

1. Volatiles by USEPA SOM0.1.2
2. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis. Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits for all surrogates associated with target compounds.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-06	Chlorobenzene	790 E	720 D	720 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS and COD DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or COD analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed on sample PRR1WATGACE-06 for COD analysis.

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
PRR1WATGACE-06	COD	71%

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.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATGACE-06 was selected for the duplicate analysis for COD. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x0 dilution) for sample location PRR1WATGACE-06 and at an 8-fold (8x0 dilution) for sample location PRR1WATGACI-06 in order to bring the concentrations within the calibration range. The laboratory reporting limits met the

PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

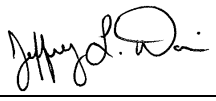
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: September 11, 2012

PEER REVIEW: Dennis Capria

DATE: October 9, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1203 - VOCs

ANALYTE	Units	PRR1WATGACE-06	LQ	VQ	PRR1WATGACI-06	LQ	VQ
2-Butanone	ug/L		40			160	
Chlorobenzene	ug/L		28			720	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1203 - Miscellaneous

ANALYTE	Units	PRR1WATCME-17	LQ	VQ	PRR1WATGACE-06	LQ	VQ	PRR1WATGACI-06	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			188		J	631		
Total Suspended Solids	mg/L	7.8			NA			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1203 - Miscellaneous

ANALYTE	Units	PRRWATSP101-5	LQ	VQ
Chemical Oxygen Demand	mg/L	NA		
Total Suspended Solids	mg/L	44		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1203

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10260-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/09/2012

% Moisture: not dec. _____ Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 6.5

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	160	
108-90-7	Chlorobenzene	720 ~~790~~	~~B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-06DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1203

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10260-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/09/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 45.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	170	J D
108-90-7	Chlorobenzene	720	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1203

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10260-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG24.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/09/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	40	
108-90-7	Chlorobenzene	28	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04062012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1203

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10260-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEG25.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/09/2012

% Moisture: not dec. Date Analyzed: 04/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-06
Lab Sample ID: 200-10260-1
Lab Name: TestAmerica Burlington
Job No.: 200-10260-2
SDG ID.: PRR1203
Matrix: Water
Date Sampled: 04/06/2012 10:10
Reporting Basis: WET
Date Received: 04/09/2012 09:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	631	160		mg/L			8	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-06 Lab Sample ID: 200-10260-2

Lab Name: TestAmerica Burlington Job No.: 200-10260-2

SDG ID.: PRR1203

Matrix: Water Date Sampled: 04/06/2012 10:15

Reporting Basis: WET Date Received: 04/09/2012 09:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	188	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-17 Lab Sample ID: 200-10260-4

Lab Name: TestAmerica Burlington Job No.: 200-10260-2

SDG ID.: PRR1203

Matrix: Water Date Sampled: 04/06/2012 10:05

Reporting Basis: WET Date Received: 04/09/2012 09:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.8	1.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRRWATSP101-5 Lab Sample ID: 200-10260-5

Lab Name: TestAmerica Burlington Job No.: 200-10260-2

SDG ID.: PRR1203

Matrix: Water Date Sampled: 04/06/2012 10:25

Reporting Basis: WET Date Received: 04/09/2012 09:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	44.0	2.0		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
60009964.0002.70004	Tierra Phase I Removal	PRR1203	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-06	4/6/2012		water	Grab	4	X	X																
PRR1WATGACE-06	4/6/2012		water	Grab	4	X	X																
TB04062012	4/6/2012		water		2	X																	
PRR1WATCME-17	4/6/2012		water	Grab	1			X															
PRRWATSP101-S	4/6/2012		water	Grab	1			X															

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	COD
3	TSS
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.0

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Les Burney	4/6/12	1030				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/6/12	1230	4/9/12 935 TA BUR			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

04/14/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1208 (200-10281)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17213R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1208 (200-10281) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-07	200-10281-1	Water	4/10/2012		X				X
PRR1WATGACE-07	200-10281-2	Water	4/10/2012		X				X
TB04102012	200-10281-3	Water	4/10/2012		X				
PRR1WATCME-20	200-10281-4	Water	4/10/2012						X
PRR1WATSP101-6	200-10281-5	Water	4/10/2012						X
PRR1WATCME-18	200-10281-6	Water	4/7/2012						X
PRR1WATCME-19	200-10281-7	Water	4/9/2012						X

1. Volatiles by USEPA SOM0.1.2
2. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis. Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits for all surrogates associated with target compounds.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-07	Chlorobenzene	150 E	140 D	140 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS and COD DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or COD analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed on sample PRR1WATGACE-07 for COD analysis.

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
PRR1WATGACE-07	COD	162%

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.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATGACE-07 was selected for the duplicate analysis for COD. The difference between the sample and duplicate values obtained for all elements met project measurement performance criteria.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 2-fold (2x0 dilution in order to bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

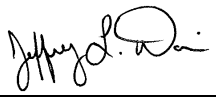
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: September 12, 2012

PEER REVIEW: Dennis Capria

DATE: October 9, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1208 - VOCs

ANALYTE	Units	PRR1WATGACE-07	LQ	VQ	PRR1WATGACI-07	LQ	VQ
2-Butanone	ug/L	63			110		
Chlorobenzene	ug/L	32			140	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1208 - Miscellaneous

ANALYTE	Units	PRR1WATCME-18	LQ	VQ	PRR1WATCME-19	LQ	VQ	PRR1WATCME-20	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			NA		
Total Suspended Solids	mg/L	6			7			6.8		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1208 - Miscellaneous

ANALYTE	Units	PRR1WATGACE-07	LQ	VQ	PRR1WATGACI-07	LQ	VQ	PRR1WATSP101-6	LQ	VQ
Chemical Oxygen Demand	mg/L	108		J	154			NA		
Total Suspended Solids	mg/L	NA			NA			48.8		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-07

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1208

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10281-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEI09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/11/2012

% Moisture: not dec. Date Analyzed: 04/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	63	
108-90-7	Chlorobenzene	32	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-07

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1208

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10281-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEI06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/11/2012

% Moisture: not dec. Date Analyzed: 04/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	110	
108-90-7	Chlorobenzene	140 ~~150~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-07DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1208

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10281-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEI05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/11/2012

% Moisture: not dec. Date Analyzed: 04/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 8.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	85	D
108-90-7	Chlorobenzene	140	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04102012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1208

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10281-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEI11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/11/2012

% Moisture: not dec. Date Analyzed: 04/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-07 | Lab Sample ID: 200-10281-1

Lab Name: TestAmerica Burlington | Job No.: 200-10281-2

SDG ID.: PRR1208

Matrix: Water | Date Sampled: 04/10/2012 10:35

Reporting Basis: WET | Date Received: 04/11/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	154	40.0		mg/L			2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-07 Lab Sample ID: 200-10281-2

Lab Name: TestAmerica Burlington Job No.: 200-10281-2

SDG ID.: PRR1208

Matrix: Water Date Sampled: 04/10/2012 10:30

Reporting Basis: WET Date Received: 04/11/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	108	40.0		mg/L		J	2	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-20 | Lab Sample ID: 200-10281-4

Lab Name: TestAmerica Burlington | Job No.: 200-10281-2

SDG ID.: PRR1208

Matrix: Water | Date Sampled: 04/10/2012 10:25

Reporting Basis: WET | Date Received: 04/11/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.8	0.83		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-6
Lab Sample ID: 200-10281-5
Lab Name: TestAmerica Burlington
Job No.: 200-10281-2
SDG ID.: PRR1208
Matrix: Water
Date Sampled: 04/10/2012 10:40
Reporting Basis: WET
Date Received: 04/11/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	48.8	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-18
Lab Sample ID: 200-10281-6
Lab Name: TestAmerica Burlington
Job No.: 200-10281-2
SDG ID.: PRR1208
Matrix: Water
Date Sampled: 04/07/2012 23:35
Reporting Basis: WET
Date Received: 04/11/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.0	1.8		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-19
Lab Sample ID: 200-10281-7
Lab Name: TestAmerica Burlington
Job No.: 200-10281-2
SDG ID.: PRR1208
Matrix: Water
Date Sampled: 04/09/2012 13:55
Reporting Basis: WET
Date Received: 04/11/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.0	1.0		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1208	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-07	4/10/2012	10:35	water	Grab	4	X	X																
PRR1WATGACE-07	4/10/2012	10:30	water	Grab	4	X	X																
TB04102012	4/10/2012	--	water	--	3	X																	
PRR1WATCME-20	4/10/2012	10:25	water	Grab	1			X															
PRRWATSP101-6	4/10/2012	10:~~40~~ 10:20	water	Grab	1			X															
PRR1WATCME-18	4/7/2012	23:35	water	Grab	1			X															
PRR1WATCME-19	4/9/2012	13:55	water	Grab	1			X															

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	COD
3	TSS
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/10/12	1400	[signature]			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/10/12	1500	[signature] 4/11/12 1017			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

04/14/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1210 (200-10307)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17215R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1210 (200-10307) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-21	200-10307-1	Water	4/11/2012		X	X	X	X	X
PRR1WATCMI-21	200-10307-2	Water	4/11/2012		X	X	X		X
TB04112012	200-10307-3	Water	4/11/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. SVOC – Semivolatile Organic Compounds by USEPA Method SOM0.1.2
3. PEST/PCB – Pesticides and PCBs by USEPA Method SOM01.2, and Chlorinated Herbicides by USEPA SW846 Method 8151A
4. MET - Metals by USEPA Method ISM01.2
5. MISC – Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC)

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. Target compounds were detected in the trip blank; however, the compounds were not detected in the associated samples. Therefore, no data qualification is necessary.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited a low concentration of butyl-benzyl phthalate. This compound was detected in the associated sample PRR1WATCME-21 at a concentration less than ten times the method blank concentration. Therefore, the butyl-benzyl phthalate detected in the sample is most likely from laboratory contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during SVOC analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1WATCME-21	Butyl-benzyl phthalate	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Sample location PRR1WATCMI-21 exhibited surrogate recoveries greater than the upper control limits (UCLs); however, only one acid fraction surrogate was greater than the UCL and the only detections for PRR1WATCMI-21 were in the acid fraction. SVOC analysis allows for one surrogate compound within each fraction to exhibit recoveries outside of the laboratory-established acceptance limits, provided that all SVOC surrogate recoveries be greater than ten percent. Therefore, no sample results require qualification.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. Sample location PRR1WATCMI-21 was diluted prior to analysis due to high analyte concentrations. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.

Qualifier	Description
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited a low concentration of beta-BHC. This compound was detected in the associated sample PRR1WATCME-21 at a concentration less than five times the method blank concentration. Therefore, the beta-BHC detected in the sample is most likely from laboratory contamination.

Several detected pesticides exhibited results that exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during pesticides analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1WATCME-21	beta-BHC	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

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.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

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.

5. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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 Location	Compound	%D
PRR1WATCME-21	Heptachlor	30.8 %
	4,4'-DDE	34.2 %
	4,4'-DDT	26.6 %
	gamma-Chlordane	38.1 %
PRR1WATCME-21 (modified method)	2,4'-DDE	136.8 %
	2,4'-DDT	131.6 %
	2,4'-DDD	39.4 %
PRR1WATCMI-21 (modified method)	2,4'-DDE	192.8 %
	2,4'-DDT	528.1 %
	2,4'-DDD	999.9 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blanks or field blank at or above the PQL during PCB analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

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.

5. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The surrogate recovery for sample location PRR1WATCMI-21 could not be determined due to dilution required in order to bring the target analyte concentration within the calibration range. The 2,4,5-T result for PRR1WATCMI-21 was therefore qualified as estimated.

The compound 2,4-DB exhibited primary and confirmation column results that exceeded the 25 percent difference control limit for the sample location PRR1WATCMI-21. The sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during herbicides analysis.

3. SURROGATES

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.

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

Sample Location	Surrogate	Recovery
PRR1WATCMI-21	2,4-Dichlorophenylacetic acid	D

D Diluted

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
Surrogate diluted below the calibration curve	Non-detect	UJ[1]
	Detect	J[1]

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

4. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

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.

5. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. Sample location PRR1WATCMI-21 required a dilution in order to bring the concentration of the target compound 2,4,5-T within the instrument calibration range. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan for all non-detected analytes.

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 Location	Compound	%D
PRR1WATCME-21	2,4-DB	106.6 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The nickel result for sample location PRR1WATCME-21 was qualified as estimated due to serial dilution percent difference exceedance. The nickel result may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during metals analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS analysis is performed to determine the accuracy of the analytical procedure in a given matrix.

The matrix spike analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. 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.

Sample location PRR1WATCME-21 was used in the serial dilution analysis. All serial dilutions were within the control limits, with the exception of the analyte presented in the following table. The nickel result for the diluted sample was greater than the nickel result for the undiluted sample.

Sample Location	Analyte	Serial Dilution (%D)
PRR1WATCME-21	Nickel	24 %

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. The qualifications are applied to all sample results associated with this analytical batch.

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

7. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

11. Overall Assessment

Overall 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.

TSS and TOC DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or TOC analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location from within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location from within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 18, 2012

PEER REVIEW: Dennis Capria

DATE: October 9, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - PCBs

ANALYTE	Units	PRR1WATCME-21	LQ	VQ
Aroclor-1016	ug/L	0.94	U	U
Aroclor-1221	ug/L	0.94	U	U
Aroclor-1232	ug/L	0.94	U	U
Aroclor-1242	ug/L	0.94	U	U
Aroclor-1248	ug/L	0.94	U	U
Aroclor-1254	ug/L	0.94	U	U
Aroclor-1260	ug/L	0.94	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - Pesticides

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
2,4'-DDD	ug/L	0.0039	J P	J	0.18	P	JN
2,4'-DDE	ug/L	0.01	J P	U	0.094	J P	U
2,4'-DDT	ug/L	0.01	J P	U	0.094	J P	U
4,4'-DDD	ug/L	0.0085	J	J	NA		
4,4'-DDE	ug/L	0.0013	J P	J	NA		
4,4'-DDT	ug/L	0.0023	J P	J	NA		
Aldrin	ug/L	0.0047	U	U	NA		
Alpha-BHC	ug/L	0.0005	J	J	NA		
Alpha-Chlordane	ug/L	0.0047	U	U	NA		
Beta-BHC	ug/L	0.0047	J P B	UB	NA		
Delta-BHC	ug/L	0.0047	U	U	0.047	U	U
Dieldrin	ug/L	0.0094	U	U	NA		
Endosulfan I	ug/L	0.0047	U	U	NA		
Endosulfan II	ug/L	0.0094	U	U	NA		
Endosulfan Sulfate	ug/L	0.0094	U	U	NA		
Endrin	ug/L	0.0094	U	U	NA		
Endrin Aldehyde	ug/L	0.0094	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.0047	U	U	NA		
Gamma-Chlordane	ug/L	0.00048	J P	J	NA		
Heptachlor	ug/L	0.00086	J P	J	NA		
Heptachlor Epoxide	ug/L	0.0047	U	U	NA		
Toxaphene	ug/L	0.47	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - Herbicides

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
2,4,5-T	ug/L	0.6			1400		J
2,4-D	ug/L	3.3			NA		
2,4-DB	ug/L	1.9	J p	U	NA		
Dinoseb	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - VOCs

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	0.32	J	J
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	1	U	U	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	10	U	U	40		
Acrolein	ug/L	20	U	U	NA		
Acrylonitrile	ug/L	20	U	U	NA		
Benzene	ug/L	1	U	U	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	U	U	NA		
Chlorobenzene	ug/L	1	U	U	NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	1	U	U	NA		
Chloromethane	ug/L	1	U	U	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	1	U	U	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	1	U	U	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - VOCs

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - SVOCs

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.9	U	U	NA		
2,4,5-Trichlorophenol	ug/L	0.18	J	J	420		
2,4,6-Trichlorophenol	ug/L	0.72	J	J	NA		
2,4-Dichlorophenol	ug/L	0.41	J	J	NA		
2,4-Dimethylphenol	ug/L	4.9	U	U	NA		
2,4-Dinitrophenol	ug/L	9.7	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.9	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.9	U	U	NA		
2-Chlorophenol	ug/L	4.9	U	U	NA		
2-Nitrophenol	ug/L	4.9	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.9	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.7	U	U	82	U	U
4-Nitrophenol	ug/L	9.7	U	U	NA		
Anthracene	ug/L	4.9	U	U	NA		
Benzidine	ug/L	9.7	U	U	NA		
Benzo(a)anthracene	ug/L	4.9	U	U	NA		
Benzo(a)pyrene	ug/L	4.9	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.9	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.9	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.9	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	1.1	J	J	NA		
Butylbenzylphthalate	ug/L	4.9	J B	UB	NA		
Chrysene	ug/L	4.9	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.9	U	U	NA		
Diethylphthalate	ug/L	4.9	U	U	NA		
Dimethylphthalate	ug/L	4.9	U	U	NA		
Di-n-Butylphthalate	ug/L	0.26	J	J	NA		
Fluoranthene	ug/L	4.9	U	U	NA		
Fluorene	ug/L	4.9	U	U	NA		
Hexachlorobenzene	ug/L	4.9	U	U	NA		
Hexachlorobutadiene	ug/L	4.9	U	U	NA		
Hexachlorocyclopentadiene	ug/L	4.9	U	U	NA		
Hexachloroethane	ug/L	4.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - SVOCs

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.9	U	U	NA		
Isophorone	ug/L	4.9	U	U	NA		
Naphthalene	ug/L	4.9	U	U	NA		
Nitrobenzene	ug/L	4.9	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.7	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.9	U	U	NA		
Pentachlorophenol	ug/L	9.7	U	U	NA		
Phenanthrene	ug/L	4.9	U	U	NA		
Phenol	ug/L	4.9	U	U	NA		
Pyrene	ug/L	4.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - Inorganics

ANALYTE	Units	PRR1WATCME-21	LQ	VQ
Antimony	ug/L	6.6		
Arsenic	ug/L	6.1		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	1.7	J	J
Copper	ug/L	7.2		
Cyanide	ug/L	1.8	J	J
Lead	ug/L	1.4		
Mercury	ug/L	0.2	U	U
Nickel	ug/L	11.2	E	J
Selenium	ug/L	18.3		
Silver	ug/L	0.24	J	J
Zinc	ug/L	11		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1210 - Miscellaneous

ANALYTE	Units	PRR1WATCME-21	LQ	VQ
Total Organic Carbon	mg/L	5.5		
Total Suspended Solids	mg/L	5.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1210
Matrix: WATER Lab Sample Id: 200-10307-1
% Solids: Date Received: 04/12/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	6.6			MS
7440-38-2	Arsenic	6.1			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	1.7	J		MS
7440-50-8	Copper	7.2			MS
7439-92-1	Lead	1.4			MS
7440-02-0	Nickel	11.2		~~B~~ J	MS
7782-49-2	Selenium	18.3			MS
7440-22-4	Silver	0.24	J		MS
7440-66-6	Zinc	11.0			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1210
Matrix: WATER Lab Sample Id: 200-10307-1
% Solids: Date Received: 04/12/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1210

Matrix: WATER Lab Sample Id: 200-10307-1

% Solids: Date Received: 04/12/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	1.8	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:

Color After: Clarity After: Artifacts:

Comments:

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEK05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/12/2012

% Moisture: not dec. Date Analyzed: 04/13/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	1.0	U
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEK05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/12/2012

% Moisture: not dec. Date Analyzed: 04/13/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEK06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/12/2012

% Moisture: not dec. Date Analyzed: 04/13/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	40	
87-61-6	1,2,3-Trichlorobenzene	0.32	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04112012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEK07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/12/2012

% Moisture: not dec. Date Analyzed: 04/13/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	5.7	
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	3.0	
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.067	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04112012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEK07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/12/2012

% Moisture: not dec. Date Analyzed: 04/13/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.83	
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.038	J
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 1030 (g/mL) mL Lab File ID: RJYRD07.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/12/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/14/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.7	U
108-95-2	Phenol	4.9	U
111-44-4	Bis(2-chloroethyl)ether	4.9	U
95-57-8	2-Chlorophenol	4.9	U
108-60-1	2,2'-Oxybis(1-chloropropane)	4.9	U
67-72-1	Hexachloroethane	4.9	U
98-95-3	Nitrobenzene	4.9	U
78-59-1	Isophorone	4.9	U
88-75-5	2-Nitrophenol	4.9	U
105-67-9	2,4-Dimethylphenol	4.9	U
120-83-2	2,4-Dichlorophenol	0.41	J
91-20-3	Naphthalene	4.9	U
87-68-3	Hexachlorobutadiene	4.9	U
77-47-4	Hexachlorocyclopentadiene	4.9	U
88-06-2	2,4,6-Trichlorophenol	0.72	J
95-95-4	2,4,5-Trichlorophenol	0.18	J
131-11-3	Dimethylphthalate	4.9	U
606-20-2	2,6-Dinitrotoluene	4.9	U
51-28-5	2,4-Dinitrophenol	9.7	U
100-02-7	4-Nitrophenol	9.7	U
121-14-2	2,4-Dinitrotoluene	4.9	U
84-66-2	Diethylphthalate	4.9	U
86-73-7	Fluorene	4.9	U
534-52-1	4,6-Dinitro-2-methylphenol	9.7	U
86-30-6	N-Nitrosodiphenylamin [1]	4.9	U
118-74-1	Hexachlorobenzene	4.9	U
87-86-5	Pentachlorophenol	9.7	U
85-01-8	Phenanthrene	4.9	U
120-12-7	Anthracene	4.9	U
84-74-2	Di-n-butylphthalate	0.26	J
206-44-0	Fluoranthene	4.9	U
92-87-5	Benzidine	9.7	U
129-00-0	Pyrene	4.9	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 1030 (g/mL) mL Lab File ID: RJYRD07.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/12/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/14/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.9 ~~0.71~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.9	U
56-55-3	Benzo(a)anthracene	4.9	U
218-01-9	Chrysene	4.9	U
117-81-7	Bis(2-ethylhexyl)phthalate	1.1	J
205-99-2	Benzo(b)fluoranthene	4.9	U
207-08-9	Benzo(k)fluoranthene	4.9	U
50-32-8	Benzo(a)pyrene	4.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.9	U
53-70-3	Dibenzo(a,h)anthracene	4.9	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-2

Sample wt/vol: 1010 (g/mL) mL Lab File ID: RJYRD08.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/12/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/14/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 8.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	420	
534-52-1	4,6-Dinitro-2-methylphenol	82	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 13AP121937-R051.D

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Extraction: (Type) SEPF Date Extracted: 04/12/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/13/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.00050	J
319-85-7	beta-BHC	0.0047 ~~0.0021~~	~~J P B~~ UB
319-86-8	delta-BHC	0.0047	U
58-89-9	gamma-BHC (Lindane)	0.0047	U
76-44-8	Heptachlor	0.00086	J ~~P~~
309-00-2	Aldrin	0.0047	U
1024-57-3	Heptachlor epoxide	0.0047	U
959-98-8	Endosulfan I	0.0047	U
60-57-1	Dieldrin	0.0094	U
72-55-9	4,4'-DDE	0.0013	J ~~P~~
72-20-8	Endrin	0.0094	U
33213-65-9	Endosulfan II	0.0094	U
72-54-8	4,4'-DDD	0.0085	J
1031-07-8	Endosulfan sulfate	0.0094	U
50-29-3	4,4'-DDT	0.0023	J ~~P~~
7421-93-4	Endrin aldehyde	0.0094	U
5103-71-9	alpha-Chlordane	0.0047	U
5103-74-2	gamma-Chlordane	0.00048	J ~~P~~
8001-35-2	Toxaphene	0.47	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 16AP120935-R051.D

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 04/12/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/16/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.010 ~~0.00033~~	~~J P~~ U
789-02-6	2,4'-DDT	0.010 ~~0.00061~~	~~J P~~ U
53-19-0	2,4'-DDD	0.0039	J ~~P~~

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-2

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 13AP121937-R081.D

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Extraction: (Type) SEPF Date Extracted: 04/12/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/13/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.047	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-2

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 16AP120935-R081.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 04/12/2012

Extraction: (Type) SEPF Date Extracted: 04/12/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/16/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.094 ~~0.036~~	~~J P~~ U
53-19-0	2,4'-DDD	0.18	~~P~~ JN
789-02-6	2,4'-DDT	0.094 ~~0.023~~	~~J P~~ U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-21

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1210

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10307-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 17AP121024-R051.D

% Moisture: Decanted: (Y/N) Date Received: 04/12/2012

Extraction: (Type) SEPF Date Extracted: 04/12/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/17/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.94	U
11104-28-2	Aroclor-1221	0.94	U
11141-16-5	Aroclor-1232	0.94	U
53469-21-9	Aroclor-1242	0.94	U
12672-29-6	Aroclor-1248	0.94	U
11097-69-1	Aroclor-1254	0.94	U
11096-82-5	Aroclor-1260	0.94	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10307-2

SDG No.: PRR1210

Client Sample ID: PRR1WATCME-21 Lab Sample ID: 200-10307-1

Matrix: Water Lab File ID: 13ap122237-r051.d

Analysis Method: 8151A Date Collected: 04/11/2012 10:45

Extraction Method: 8151A Date Extracted: 04/13/2012 10:21

Sample wt/vol: 905(mL) Date Analyzed: 04/14/2012 01:15

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36991 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.9 ~~0.54~~	~~J p~~ U	1.9	0.52
88-85-7	Dinoseb	1.0	U	1.0	0.21
93-76-5	2,4,5-T	0.60		0.52	0.14

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	78		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10307-2

SDG No.: PRR1210

Client Sample ID: PRR1WATCME-21 Lab Sample ID: 200-10307-1

Matrix: Water Lab File ID: 13ap122237-r051.d

Analysis Method: 8151A Date Collected: 04/11/2012 10:45

Extraction Method: 8151A Date Extracted: 04/13/2012 10:21

Sample wt/vol: 905(mL) Date Analyzed: 04/14/2012 01:15

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 36991 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	3.3		2.1	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	81		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-10307-2

SDG No.: PRR1210

Client Sample ID: PRR1WATCMI-21 | Lab Sample ID: 200-10307-2

Matrix: Water | Lab File ID: 16ap121238-r041.d

Analysis Method: 8151A | Date Collected: 04/11/2012 10:40

Extraction Method: 8151A | Date Extracted: 04/13/2012 10:21

Sample wt/vol: 1060(mL) | Date Analyzed: 04/16/2012 14:44

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1000

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 37005 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	1400	J	440	120

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10307-2

SDG No.: PRR1210

Client Sample ID: PRR1WATCMI-21 Lab Sample ID: 200-10307-2

Matrix: Water Lab File ID: 16ap121238-r041.d

Analysis Method: 8151A Date Collected: 04/11/2012 10:40

Extraction Method: 8151A Date Extracted: 04/13/2012 10:21

Sample wt/vol: 1060(mL) Date Analyzed: 04/16/2012 14:44

Con. Extract Vol.: 10000(uL) Dilution Factor: 1000

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37005 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-21 Lab Sample ID: 200-10307-1

Lab Name: TestAmerica Burlington Job No.: 200-10307-2

SDG ID.: PRR1210

Matrix: Water Date Sampled: 04/11/2012 10:45

Reporting Basis: WET Date Received: 04/12/2012 10:05

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	5.5	1.0	0.14	mg/L			1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-21 Lab Sample ID: 200-10307-1

Lab Name: TestAmerica Burlington Job No.: 200-10307-3

SDG ID.: PRR1210

Matrix: Water Date Sampled: 04/11/2012 10:45

Reporting Basis: WET Date Received: 04/12/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.2	0.48		mg/L			1	SM 2540D

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1210	

SAMPLERS: M.Pelenski/S.Campbell

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-21	4/11/2012	10:45	water	Grab	17	X	X	X	X	X	X	X	X	X									
PRR1WATCMI-21	4/11/2012	10:40	water	Grab	9		X	X		X			X										
TB04112012	4/11/2012	10:40	water	—	3	X																	

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 1S-4 for Effluent Samples and 15-5 for Influent Samples

Triple volume collected for MS/MSD for PRR1WATCME-15 (except TSS and WET Testing)

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	04/11/12	1300	[illegible] 4/12/12 1005			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCBs as Congeners Analyses

SDG# PRR1210 (33712)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17216R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1210 (33712) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1WATCME-21	33712-001	Water	4/11/2012				X	X	
PRR1WATCMI-21	33712-002	Water	4/11/2012				X	X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613
2. PCB – Polychlorinated Biphenyls as Congeners by USEPA Method 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

The compound 2,3,7,8-TCDF was detected in sample location PRR1WATCMI-21. The confirmation analysis was not reported.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

CONGENER PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Some sample results required qualification as not detected because the compounds were also detected in the associated method blank and field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank or field blank at or above the project quantitation limits (PQL) during PCB analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as 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).

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-21	PCB-11 PCB-81 PCB-126	Detected sample results > RL and < BAL	"UB" at detected sample concentration

RL = reporting limit

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

Sample results (in pg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCMI-21	PCB-18	27200 E	--	27200 EJ

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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 18, 2012

PEER REVIEW: Dennis Capria

DATE: October 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - PCB Congeners

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
PCB-1	pg/L	4.88	U	U	5310		
PCB-2	pg/L	4.88	U	U	1070		
PCB-3	pg/L	4.88	U	U	1570		
PCB-4/10	pg/L	20.4			8000		
PCB-5/8	pg/L	44			13200		
PCB-6	pg/L	15.5			4400		
PCB-7/9	pg/L	9.76	U	U	1890		
PCB-11	pg/L	59.3	B	UB	4250	B	
PCB-12/13	pg/L	9.76	U	U	2050		
PCB-14	pg/L	9.76	U	U	375		
PCB-15	pg/L	12.3			2250		
PCB-16/32	pg/L	131			15800		
PCB-17	pg/L	94.9			11400		
PCB-18	pg/L	210			27200	E	EJ
PCB-19	pg/L	20.8			2750		
PCB-20/21/33	pg/L	129			13300		
PCB-22	pg/L	83			8750		
PCB-23	pg/L	4.88	U	U	45.9		
PCB-24/27	pg/L	15.6			1930		
PCB-25	pg/L	30.2			3450		
PCB-26	pg/L	39.6			4150		
PCB-28	pg/L	223			22100		
PCB-29	pg/L	4.88	U	U	175		
PCB-30	pg/L	4.88	U	U	27.1		
PCB-31	pg/L	272			21200		
PCB-34	pg/L	4.88	U	U	211		
PCB-35	pg/L	5.92			482		
PCB-36	pg/L	4.88	U	U	22.4		
PCB-37	pg/L	37.9			3590		
PCB-38	pg/L	4.88	U	U	193		
PCB-39	pg/L	4.88	U	U	64		
PCB-40	pg/L	65.3			3940		
PCB-41/64/71/72	pg/L	294			16300		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - PCB Congeners

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
PCB-42/59	pg/L	114			6840		
PCB-43/49	pg/L	306			18500		
PCB-44	pg/L	350			21300		
PCB-45	pg/L	62.4			4360		
PCB-46	pg/L	29.1			1900		
PCB-47	pg/L	111			6140		
PCB-48/75	pg/L	84			5090		
PCB-50	pg/L	4.88	U	U	99.6		
PCB-51	pg/L	32.5			2040		
PCB-52/69	pg/L	378			22500		
PCB-53	pg/L	66.4			4100		
PCB-54	pg/L	4.88	U	U	206		
PCB-55	pg/L	6.08			262		
PCB-56/60	pg/L	207			11200		
PCB-57	pg/L	4.88	U	U	103		
PCB-58	pg/L	4.88	U	U	46.6		
PCB-61/70	pg/L	378			20800		
PCB-62	pg/L	4.88	U	U	5.09	U	U
PCB-63	pg/L	13.6			734		
PCB-65	pg/L	4.88	U	U	5.09	U	U
PCB-67	pg/L	13.8			778		
PCB-68	pg/L	4.88	U	U	66.5		
PCB-73	pg/L	4.88	U	U	5.09	U	U
PCB-74	pg/L	151			8660		
PCB-76/66	pg/L	275			15300		
PCB-77	pg/L	35.5	B		1260	B	
PCB-78	pg/L	4.88	U	U	5.09	U	U
PCB-79	pg/L	5.73			163		
PCB-80	pg/L	4.88	U	U	5.09	U	U
PCB-81	pg/L	4.88	J,B	UB	55	B	
PCB-82	pg/L	75.9			2340		
PCB-83	pg/L	4.88	U	U	9.07		
PCB-84/92	pg/L	206			7470		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - PCB Congeners

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
PCB-85/116	pg/L	91.1			2830		
PCB-86	pg/L	4.88	U	U	120		
PCB-87/117/125	pg/L	168			5570		
PCB-88/91	pg/L	89.6			2940		
PCB-89	pg/L	11.6			376		
PCB-90/101	pg/L	517			17200		
PCB-93	pg/L	4.88	U	U	5.09	U	U
PCB-94	pg/L	6.67			194		
PCB-95/98/102	pg/L	400			14000		
PCB-96	pg/L	8.65			235		
PCB-97	pg/L	162			5350		
PCB-99	pg/L	257			8200		
PCB-100	pg/L	10.8			343		
PCB-103	pg/L	7.26			248		
PCB-104	pg/L	4.88	U	U	46.2		
PCB-105	pg/L	152	B		4150	B	
PCB-106/118	pg/L	436	B		12300	B	
PCB-107/109	pg/L	35.1			903		
PCB-108/112	pg/L	26.1			806		
PCB-110	pg/L	560			18200		
PCB-111/115	pg/L	10.3			308		
PCB-113	pg/L	4.88	U	U	5.09	U	U
PCB-114	pg/L	12.3			335		
PCB-119	pg/L	12.4			430		
PCB-120	pg/L	4.88	U	U	28		
PCB-121	pg/L	4.88	U	U	5.09	U	U
PCB-122	pg/L	6.79			180		
PCB-123	pg/L	9.4	B		240	B	
PCB-124	pg/L	19.8			508		
PCB-126	pg/L	4.88	J,B	UB	53.9	B	
PCB-127	pg/L	4.88	U	U	5.09	U	U
PCB-128/162	pg/L	104			1830		
PCB-129	pg/L	34.7			608		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - PCB Congeners

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
PCB-130	pg/L	44.3			848		
PCB-131	pg/L	4.88	U	U	5.46		
PCB-132/161	pg/L	185			3540		
PCB-133/142	pg/L	22.4			393		
PCB-134/143	pg/L	33.7			659		
PCB-135	pg/L	75.6			1560		
PCB-136	pg/L	88.6			1830		
PCB-137	pg/L	35.3			573		
PCB-138/163/164	pg/L	659			12200		
PCB-139/149	pg/L	473			9370		
PCB-140	pg/L	5.69			90.2		
PCB-141	pg/L	132			2420		
PCB-144	pg/L	28.1			545		
PCB-145	pg/L	4.88	U	U	5.35		
PCB-146/165	pg/L	98.8			1760		
PCB-147	pg/L	19.8			357		
PCB-148	pg/L	4.88	U	U	28.6		
PCB-150	pg/L	4.88	U	U	50.2		
PCB-151	pg/L	136			2750		
PCB-152	pg/L	4.88	U	U	22		
PCB-153	pg/L	627			11400		
PCB-154	pg/L	17.3			309		
PCB-155	pg/L	22.6			374		
PCB-156	pg/L	69.9	B		1170	B	
PCB-157	pg/L	16	B		255	B	
PCB-158/160	pg/L	69.7			1310		
PCB-159	pg/L	10.6			131		
PCB-166	pg/L	4.88	U	U	62.3		
PCB-167	pg/L	29	B		468	B	
PCB-168	pg/L	4.88	U	U	21.8		
PCB-169	pg/L	1.15	U,*	U	2.87	J	J
PCB-170	pg/L	220			2690		
PCB-171	pg/L	56.5			728		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - PCB Congeners

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
PCB-172	pg/L	35.6			441		
PCB-173	pg/L	5.87			71.7		
PCB-174	pg/L	243			3130		
PCB-175	pg/L	11.4			136		
PCB-176	pg/L	36.1			465		
PCB-177	pg/L	141			1770		
PCB-178	pg/L	53.6			696		
PCB-179	pg/L	126			1640		
PCB-180	pg/L	542			6620		
PCB-181	pg/L	4.88	U	U	19.6		
PCB-182/187	pg/L	329			4200		
PCB-183	pg/L	145			1840		
PCB-184	pg/L	4.88	U	U	24.9		
PCB-185	pg/L	27.9			354		
PCB-186	pg/L	4.88	U	U	5.09	U	U
PCB-188	pg/L	4.88	U	U	14.4		
PCB-189	pg/L	9.25	B		108	B	
PCB-190	pg/L	47.9			586		
PCB-191	pg/L	8.31			100		
PCB-192	pg/L	4.88	U	U	5.09	U	U
PCB-193	pg/L	24.2			296		
PCB-194	pg/L	154			1480		
PCB-195	pg/L	56.8			586		
PCB-196/203	pg/L	188			1840		
PCB-197	pg/L	7.26			64		
PCB-198	pg/L	9.16			81.3		
PCB-199	pg/L	189			1870		
PCB-200	pg/L	25.6			227		
PCB-201	pg/L	24.5			243		
PCB-202	pg/L	43.2			428		
PCB-204	pg/L	4.88	U	U	5.09	U	U
PCB-205	pg/L	9.69			100		
PCB-206	pg/L	118			1100		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - PCB Congeners

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
PCB-207	pg/L	14.4			133		
PCB-208	pg/L	35.7			310		
PCB-209	pg/L	322			8060		
Total monoCB	pg/L	4.88	U	U	7950		
Total diCB	pg/L	151	B		36400	B	
Total triCB	pg/L	1290			137000		J
Total tetraCB	pg/L	2980	B		173000	B	
Total pentaCB	pg/L	3300	B		106000	B	
Total hexaCB	pg/L	3040	B		57000	B	
Total heptaCB	pg/L	2060	B		25900	B	
Total octaCB	pg/L	707			6910		
Total nonaCB	pg/L	169			1550		
Total decaCB	pg/L	322			8060		
Total PCB	pg/L	14000	B		559000	B	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1210 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-21	LQ	VQ	PRR1WATCMI-21	LQ	VQ
2,3,7,8-TCDD	pg/L	97.8			3650		
1,2,3,7,8-PeCDD	pg/L	1.27	J	J	15.5	J	J
1,2,3,4,7,8-HxCDD	pg/L	1.5	U	U	5.37	J	J
1,2,3,6,7,8-HxCDD	pg/L	1.7	U	U	27.3		
1,2,3,7,8,9-HxCDD	pg/L	1.82	U	U	13.3	J	J
1,2,3,4,6,7,8-HpCDD	pg/L	11.5	J	J	170		
OCDD	pg/L	181			4830		
Total TCDD	pg/L	128			5060		
Total PeCDD	pg/L	6			191		
Total HxCDD	pg/L	2.54			163		
Total HpCDD	pg/L	24.3			364		
2,3,7,8-TCDF	pg/L	1.3	U	U	30.5		
1,2,3,7,8-PeCDF	pg/L	1.9	U	U	15.6	J	J
2,3,4,7,8-PeCDF	pg/L	3.21	J	J	69.9		
1,2,3,4,7,8-HxCDF	pg/L	19.2	J	J	553		
1,2,3,6,7,8-HxCDF	pg/L	3.49	J	J	92.3		
1,2,3,7,8,9-HxCDF	pg/L	1.85	U	U	14.8	J	J
2,3,4,6,7,8-HxCDF	pg/L	2.32	J	J	44.6		
1,2,3,4,6,7,8-HpCDF	pg/L	49.6			1370		
1,2,3,4,7,8,9-HpCDF	pg/L	2.87	U	U	69.6		
OCDF	pg/L	266			9650		
Total TCDF	pg/L	139			6610		
Total PeCDF	pg/L	96.8			3160		
Total HxCDF	pg/L	47.6			1400		
Total HpCDF	pg/L	60.8			1720		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	104			3790		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: **PRR1WATCME-21** **EPA Method 1613**

Client Data
Name: ARCADIS U.S., Inc.
Project: PRR1210
Date Collected: 11-Apr-12
Time Collected: 1045

Sample Data
Matrix: Aqueous
Sample Size: 0.962 L

Laboratory Data
Lab Sample: 33712-001
QC Batch No.: 4375
Date Analyzed DB-5: 13-Apr-12
Date Received: 12-Apr-12
Date Extracted: 12-Apr-12
Date Analyzed DB-225: NA

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	97.8			
1,2,3,7,8-PeCDD	1.27			J
1,2,3,4,7,8-HxCDD	ND	1.50		
1,2,3,6,7,8-HxCDD	ND	1.70		
1,2,3,7,8,9-HxCDD	ND	1.82		
1,2,3,4,6,7,8-HpCDD	11.5			J
OCDD	181			
2,3,7,8-TCDF	ND	1.30		
1,2,3,7,8-PeCDF	ND	1.90		
2,3,4,7,8-PeCDF	3.21			J
1,2,3,4,7,8-HxCDF	19.2			J
1,2,3,6,7,8-HxCDF	3.49			J
2,3,4,6,7,8-HxCDF	2.32			J
1,2,3,7,8,9-HxCDF	ND	1.85		
1,2,3,4,6,7,8-HpCDF	49.6			
1,2,3,4,7,8,9-HpCDF	ND	2.87		
OCDF	266			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	83.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	71.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	69.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	69.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	60.4	23 - 140	
	13C-OCDD	53.8	17 - 157	
	13C-2,3,7,8-TCDF	82.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	81.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	82.2	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	81.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	74.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	73.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	67.4	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	66.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	65.8	26 - 138	
	13C-OCDF	56.0	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Totals

Total TCDD	128	
Total PeCDD	6.00	
Total HxCDD	2.54	5.52
Total HpCDD	24.3	
Total TCDF	139	
Total PeCDF	96.8	105
Total HxCDF	47.6	54.3
Total HpCDF	60.8	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 103

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.
e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: ANP

Approved By: Rose Harrelson 18-Apr-2012 13:17

Sample ID: **PRR1WATCMI-21** **EPA Method 1613**

Client Data
Name: ARCADIS U.S., Inc.
Project: PRR1210
Date Collected: 11-Apr-12
Time Collected: 1040

Sample Data
Matrix: Aqueous
Sample Size: 1.02 L

Laboratory Data
Lab Sample: 33712-002
QC Batch No.: 4375
Date Analyzed DB-5: 13-Apr-12
Date Received: 12-Apr-12
Date Extracted: 12-Apr-12
Dates Analyzed DB-225: 16-Apr-12

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	3650			
1,2,3,7,8-PeCDD	15.5			J
1,2,3,4,7,8-HxCDD	5.37			J
1,2,3,6,7,8-HxCDD	27.3			
1,2,3,7,8,9-HxCDD	13.3			J
1,2,3,4,6,7,8-HpCDD	170			
OCDD	4830			
2,3,7,8-TCDF	30.5			
1,2,3,7,8-PeCDF	15.6			J
2,3,4,7,8-PeCDF	69.9			
1,2,3,4,7,8-HxCDF	553			
1,2,3,6,7,8-HxCDF	92.3			
2,3,4,6,7,8-HxCDF	44.6			
1,2,3,7,8,9-HxCDF	14.8			J
1,2,3,4,6,7,8-HpCDF	1370			
1,2,3,4,7,8,9-HpCDF	69.6			
OCDF	9650			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	94.2	25 - 164	
	13C-1,2,3,7,8-PeCDD	92.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	79.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	75.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	76.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	70.3	23 - 140	
	13C-OCDD	64.7	17 - 157	
	13C-2,3,7,8-TCDF	90.7	24 - 169	
	13C-1,2,3,7,8-PeCDF	84.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.4	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	91.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	82.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	79.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	77.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	76.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	74.2	26 - 138	
	13C-OCDF	70.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	108	35 - 197	

Totals

Total TCDD	5060	
Total PeCDD	191	192
Total HxCDD	163	168
Total HpCDD	364	
Total TCDF	6610	
Total PeCDF	3160	
Total HxCDF	1400	1400
Total HpCDF	1720	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 3790

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.
e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: ANP

Approved By: Rose Harrelson 18-Apr-2012 13:17

Sample ID:	PRR1WATCME-21			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33712-001	Date Received: 12-Apr-12
Project:	PRR1210	Sample Size: 1.02 L	QC Batch No.: 4374	Date Extracted: 12-Apr-12
Date Collected:	11-Apr-12	%Solids: 1.03	Date Analyzed DB-1 13-Apr-12	
Time Collected:	1045			

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	ND	4.88		PCB-41/64/71/72	294	4.88	
PCB-2	ND	4.88		PCB-42/59	114	4.88	
PCB-3	ND	4.88		PCB-43/49	306	4.88	
PCB-4/10	20.4	9.76		PCB-44	350	4.88	
PCB-5/8	44.0	9.76		PCB-45	62.4	4.88	
PCB-6	15.5	9.76		PCB-46	29.1	4.88	
PCB-7/9	ND	9.76		PCB-47	111	4.88	
PCB-11	ND ~~59.3~~	59.3 ~~9.76~~	UB	PCB-48/75	84.0	4.88	
PCB-12/13	ND	9.76		PCB-50	ND	4.88	
PCB-14	ND	9.76		PCB-51	32.5	4.88	
PCB-15	12.3	9.76		PCB-52/69	378	4.88	
PCB-16/32	131	4.88		PCB-53	66.4	4.88	
PCB-17	94.9	4.88		PCB-54	ND	4.88	
PCB-18	210	4.88		PCB-55	6.08	4.88	
PCB-19	20.8	4.88		PCB-56/60	207	4.88	
PCB-20/21/33	129	4.88		PCB-57	ND	4.88	
PCB-22	83.0	4.88		PCB-58	ND	4.88	
PCB-23	ND	4.88		PCB-61/70	378	4.88	
PCB-24/27	15.6	4.88		PCB-62	ND	4.88	
PCB-25	30.2	4.88		PCB-63	13.6	4.88	
PCB-26	39.6	4.88		PCB-65	ND	4.88	
PCB-28	223	4.88		PCB-67	13.8	4.88	
PCB-29	ND	4.88		PCB-68	ND	4.88	
PCB-30	ND	4.88		PCB-73	ND	4.88	
PCB-31	272	4.88		PCB-74	151	4.88	
PCB-34	ND	4.88		PCB-76/66	275	4.88	
PCB-35	5.92	4.88		PCB-77	35.5	4.88	~~B~~
PCB-36	ND	4.88		PCB-78	ND	4.88	
PCB-37	37.9	4.88		PCB-79	5.73	4.88	
PCB-38	ND	4.88		PCB-80	ND	4.88	
PCB-39	ND	4.88		PCB-81	ND ~~1.19~~	4.88	~~J,B~~ UB
PCB-40	65.3	4.88		PCB-82	75.9	4.88	

Sample ID:	PRR1WATCME-21			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33712-001	Date Received:	12-Apr-12
Project:	PRR1210	Sample Size:	1.02 L	QC Batch No.:	4374	Date Extracted:	12-Apr-12
Date Collected:	11-Apr-12	%Solids:	1.03	Date Analyzed DB-1	13-Apr-12		
Time Collected:	1045						

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.88		PCB-127	ND	4.88	
PCB-84/92	206	4.88		PCB-128/162	104	4.88	
PCB-85/116	91.1	4.88		PCB-129	34.7	4.88	
PCB-86	ND	4.88		PCB-130	44.3	4.88	
PCB-87/117/125	168	4.88		PCB-131	ND	4.88	
PCB-88/91	89.6	4.88		PCB-132/161	185	4.88	
PCB-89	11.6	4.88		PCB-133/142	22.4	4.88	
PCB-90/101	517	4.88		PCB-134/143	33.7	4.88	
PCB-93	ND	4.88		PCB-135	75.6	4.88	
PCB-94	6.67	4.88		PCB-136	88.6	4.88	
PCB-95/98/102	400	4.88		PCB-137	35.3	4.88	
PCB-96	8.65	4.88		PCB-138/163/164	659	4.88	
PCB-97	162	4.88		PCB-139/149	473	4.88	
PCB-99	257	4.88		PCB-140	5.69	4.88	
PCB-100	10.8	4.88		PCB-141	132	4.88	
PCB-103	7.26	4.88		PCB-144	28.1	4.88	
PCB-104	ND	4.88		PCB-145	ND	4.88	
PCB-105	152	4.88	~~B~~	PCB-146/165	98.8	4.88	
PCB-106/118	436	4.88	~~B~~	PCB-147	19.8	4.88	
PCB-107/109	35.1	4.88		PCB-148	ND	4.88	
PCB-108/112	26.1	4.88		PCB-150	ND	4.88	
PCB-110	560	4.88		PCB-151	136	4.88	
PCB-111/115	10.3	4.88		PCB-152	ND	4.88	
PCB-113	ND	4.88		PCB-153	627	4.88	
PCB-114	12.3	4.88		PCB-154	17.3	4.88	
PCB-119	12.4	4.88		PCB-155	22.6	4.88	
PCB-120	ND	4.88		PCB-156	69.9	4.88	~~B~~
PCB-121	ND	4.88		PCB-157	16.0	4.88	~~B~~
PCB-122	6.79	4.88		PCB-158/160	69.7	4.88	
PCB-123	9.40	4.88	~~B~~	PCB-159	10.6	4.88	
PCB-124	19.8	4.88		PCB-166	ND	4.88	
PCB-126	~~3.33~~ ND	4.88	~~J,B~~ UB	PCB-167	29.0	4.88	~~B~~

Sample ID:	PRR1WATCME-21			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33712-001	Date Received: 12-Apr-12
Project:	PRR1210	Sample Size: 1.02 L	QC Batch No.: 4374	Date Extracted: 12-Apr-12
Date Collected:	11-Apr-12	%Solids: 1.03	Date Analyzed DB-1 13-Apr-12	
Time Collected:	1045			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	4.88	
PCB-169	ND	1.15	*
PCB-170	220	4.88	
PCB-171	56.5	4.88	
PCB-172	35.6	4.88	
PCB-173	5.87	4.88	
PCB-174	243	4.88	
PCB-175	11.4	4.88	
PCB-176	36.1	4.88	
PCB-177	141	4.88	
PCB-178	53.6	4.88	
PCB-179	126	4.88	
PCB-180	542	4.88	
PCB-181	ND	4.88	
PCB-182/187	329	4.88	
PCB-183	145	4.88	
PCB-184	ND	4.88	
PCB-185	27.9	4.88	
PCB-186	ND	4.88	
PCB-188	ND	4.88	
PCB-189	9.25	4.88	B
PCB-190	47.9	4.88	
PCB-191	8.31	4.88	
PCB-192	ND	4.88	
PCB-193	24.2	4.88	
PCB-194	154	4.88	
PCB-195	56.8	4.88	
PCB-196/203	188	4.88	
PCB-197	7.26	4.88	
PCB-198	9.16	4.88	
PCB-199	189	4.88	
PCB-200	25.6	4.88	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	24.5	4.88	
PCB-202	43.2	4.88	
PCB-204	ND	4.88	
PCB-205	9.69	4.88	
PCB-206	118	4.88	
PCB-207	14.4	4.88	
PCB-208	35.7	4.88	
PCB-209	322	4.88	
Total monoCB	ND	4.88	
Total diCB	151	9.76	B
Total triCB	1290	4.88	
Total tetraCB	2980	4.88	B
Total pentaCB	3300	4.88	B
Total hexaCB	3040	4.88	B
Total heptaCB	2060	4.88	B
Total octaCB	707	4.88	
Total nonaCB	169	4.88	
Total decaCB	322	4.88	
Total PCB	14000	9.76	B

TEQ(WHO-2005 Mammal [(Min)]: 0.359

Sample ID:	PRR1WATCMI-21			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33712-002	Date Received:	12-Apr-12
Project:	PRR1210	Sample Size:	0.983 L	QC Batch No.:	4374	Date Extracted:	12-Apr-12
Date Collected:	11-Apr-12	%Solids:	1.01	Date Analyzed DB-1	13-Apr-12		
Time Collected:	1040						

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	5310	5.09		PCB-41/64/71/72	16300	5.09	
PCB-2	1070	5.09		PCB-42/59	6840	5.09	
PCB-3	1570	5.09		PCB-43/49	18500	5.09	
PCB-4/10	8000	10.2		PCB-44	21300	5.09	
PCB-5/8	13200	10.2		PCB-45	4360	5.09	
PCB-6	4400	10.2		PCB-46	1900	5.09	
PCB-7/9	1890	10.2		PCB-47	6140	5.09	
PCB-11	4250	10.2	B	PCB-48/75	5090	5.09	
PCB-12/13	2050	10.2		PCB-50	99.6	5.09	
PCB-14	375	10.2		PCB-51	2040	5.09	
PCB-15	2250	10.2		PCB-52/69	22500	5.09	
PCB-16/32	15800	5.09		PCB-53	4100	5.09	
PCB-17	11400	5.09		PCB-54	206	5.09	
PCB-18	27200	5.09	E J	PCB-55	262	5.09	
PCB-19	2750	5.09		PCB-56/60	11200	5.09	
PCB-20/21/33	13300	5.09		PCB-57	103	5.09	
PCB-22	8750	5.09		PCB-58	46.6	5.09	
PCB-23	45.9	5.09		PCB-61/70	20800	5.09	
PCB-24/27	1930	5.09		PCB-62	ND	5.09	
PCB-25	3450	5.09		PCB-63	734	5.09	
PCB-26	4150	5.09		PCB-65	ND	5.09	
PCB-28	22100	5.09		PCB-67	778	5.09	
PCB-29	175	5.09		PCB-68	66.5	5.09	
PCB-30	27.1	5.09		PCB-73	ND	5.09	
PCB-31	21200	5.09		PCB-74	8660	5.09	
PCB-34	211	5.09		PCB-76/66	15300	5.09	
PCB-35	482	5.09		PCB-77	1260	5.09	B
PCB-36	22.4	5.09		PCB-78	ND	5.09	
PCB-37	3590	5.09		PCB-79	163	5.09	
PCB-38	193	5.09		PCB-80	ND	5.09	
PCB-39	64.0	5.09		PCB-81	55.0	5.09	B
PCB-40	3940	5.09		PCB-82	2340	5.09	

Sample ID:	PRR1WATCMI-21			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33712-002	Date Received:	12-Apr-12
Project:	PRR1210	Sample Size:	0.983 L	QC Batch No.:	4374	Date Extracted:	12-Apr-12
Date Collected:	11-Apr-12	%Solids:	1.01	Date Analyzed DB-1	13-Apr-12		
Time Collected:	1040						

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	9.07	5.09		PCB-127	ND	5.09	
PCB-84/92	7470	5.09		PCB-128/162	1830	5.09	
PCB-85/116	2830	5.09		PCB-129	608	5.09	
PCB-86	120	5.09		PCB-130	848	5.09	
PCB-87/117/125	5570	5.09		PCB-131	5.46	5.09	
PCB-88/91	2940	5.09		PCB-132/161	3540	5.09	
PCB-89	376	5.09		PCB-133/142	393	5.09	
PCB-90/101	17200	5.09		PCB-134/143	659	5.09	
PCB-93	ND	5.09		PCB-135	1560	5.09	
PCB-94	194	5.09		PCB-136	1830	5.09	
PCB-95/98/102	14000	5.09		PCB-137	573	5.09	
PCB-96	235	5.09		PCB-138/163/164	12200	5.09	
PCB-97	5350	5.09		PCB-139/149	9370	5.09	
PCB-99	8200	5.09		PCB-140	90.2	5.09	
PCB-100	343	5.09		PCB-141	2420	5.09	
PCB-103	248	5.09		PCB-144	545	5.09	
PCB-104	46.2	5.09		PCB-145	5.35	5.09	
PCB-105	4150	5.09	B	PCB-146/165	1760	5.09	
PCB-106/118	12300	5.09	B	PCB-147	357	5.09	
PCB-107/109	903	5.09		PCB-148	28.6	5.09	
PCB-108/112	806	5.09		PCB-150	50.2	5.09	
PCB-110	18200	5.09		PCB-151	2750	5.09	
PCB-111/115	308	5.09		PCB-152	22.0	5.09	
PCB-113	ND	5.09		PCB-153	11400	5.09	
PCB-114	335	5.09		PCB-154	309	5.09	
PCB-119	430	5.09		PCB-155	374	5.09	
PCB-120	28.0	5.09		PCB-156	1170	5.09	B
PCB-121	ND	5.09		PCB-157	255	5.09	B
PCB-122	180	5.09		PCB-158/160	1310	5.09	
PCB-123	240	5.09	B	PCB-159	131	5.09	
PCB-124	508	5.09		PCB-166	62.3	5.09	
PCB-126	53.9	5.09	B	PCB-167	468	5.09	B

Sample ID:	PRR1WATCMI-21			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33712-002	Date Received: 12-Apr-12
Project:	PRR1210	Sample Size: 0.983 L	QC Batch No.: 4374	Date Extracted: 12-Apr-12
Date Collected:	11-Apr-12	%Solids: 1.01	Date Analyzed DB-1 13-Apr-12	
Time Collected:	1040			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	21.8	5.09	
PCB-169	2.87	5.09	J
PCB-170	2690	5.09	
PCB-171	728	5.09	
PCB-172	441	5.09	
PCB-173	71.7	5.09	
PCB-174	3130	5.09	
PCB-175	136	5.09	
PCB-176	465	5.09	
PCB-177	1770	5.09	
PCB-178	696	5.09	
PCB-179	1640	5.09	
PCB-180	6620	5.09	
PCB-181	19.6	5.09	
PCB-182/187	4200	5.09	
PCB-183	1840	5.09	
PCB-184	24.9	5.09	
PCB-185	354	5.09	
PCB-186	ND	5.09	
PCB-188	14.4	5.09	
PCB-189	108	5.09	~~B~~
PCB-190	586	5.09	
PCB-191	100	5.09	
PCB-192	ND	5.09	
PCB-193	296	5.09	
PCB-194	1480	5.09	
PCB-195	586	5.09	
PCB-196/203	1840	5.09	
PCB-197	64.0	5.09	
PCB-198	81.3	5.09	
PCB-199	1870	5.09	
PCB-200	227	5.09	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	243	5.09	
PCB-202	428	5.09	
PCB-204	ND	5.09	
PCB-205	100	5.09	
PCB-206	1100	5.09	
PCB-207	133	5.09	
PCB-208	310	5.09	
PCB-209	8060	5.09	
Total monoCB	7950	5.09	
Total diCB	36400	10.2	~~B~~
Total triCB	137000	5.09	J
Total tetraCB	173000	5.09	~~B~~
Total pentaCB	106000	5.09	~~B~~
Total hexaCB	57000	5.09	~~B~~
Total heptaCB	25900	5.09	~~B~~
Total octaCB	6910	5.09	
Total nonaCB	1550	5.09	
Total decaCB	8060	5.09	
Total PCB	559000	10.2	~~B~~ J

TEQ(WHO-2005 Mammal [(Min)]: 6.19

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33712 1.2°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1210	

M.Pelenski/S.Campbell

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-21	4/11/2012	10:45	water	Grab	4	X	X																
PRR1WATCMI-21	4/11/2012	10:40	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

Triple volume collected for MS/MSD for PRR1WATCME-15

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	04/11/12	1300	[signature] 4/12/12	[signature]	0900	
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1215 (200-10376)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17220R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1215 (200-10376) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-22	200-10376-1	Water	4/13/2012						X
PRR1WATCME-23	200-10376-2	Water	4/13/2012						X
PRR1WATGACI-08	200-10376-3	Water	4/13/2012		X				X
PRR1WATGACE-08	200-10376-4	Water	4/13/2012		X				X
TB04132012	200-10376-5	Water	4/13/2012		X				
PRR1WATSP101-07	200-10376-6	Water	4/13/2012						X
PRR1WATCME-24	200-10376-7	Water	4/13/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

A surrogate recovery greater than the upper control limit was observed for sample location PRR1WATGACE-08. Therefore, detected results for the PRR1WATGACE-08 indicate a potential high bias.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analyses was not performed on a sample location from within this SDG..

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were analyzed at a 2-fold (2x) dilution; however, no non-detects were reported. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS and COD DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The COD results were qualified as estimated because the matrix spike recovery was less than the lower control limit. The COD results may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or COD analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed using sample PRR1WATGACE-08 for COD analysis. All analytes associated with MS recoveries were within the control limits with the exception of the following analytes present in the table below.

Sample Location	Analyte	MS Recovery
PRR1WATGACE-08	COD	38 %

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 the analytical batch.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATGACE-08 was selected for the duplicate analysis for COD. The relative percent difference (RPD) between the sample and duplicate values obtained met the project measurement performance criteria.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x) dilution in order to bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs stated

in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 19, 2012

PEER REVIEW: Dennis Capria

DATE: October 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1215 - VOCs

ANALYTE	Units	PRR1WATGACE-08	LQ	VQ	PRR1WATGACI-08	LQ	VQ
2-Butanone	ug/L	4.4	J	J	18		
Chlorobenzene	ug/L	12			2.1		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1215 - Miscellaneous

ANALYTE	Units	PRR1WATCME-22	LQ	VQ	PRR1WATCME-23	LQ	VQ	PRR1WATCME-24	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			NA		
Total Suspended Solids	mg/L	5.5			6.7			10		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1215 - Miscellaneous

ANALYTE	Units	PRR1WATGACE-08	LQ	VQ	PRR1WATGACI-08	LQ	VQ	PRR1WATSP101-07	LQ	VQ
Chemical Oxygen Demand	mg/L	322		J	259		J	NA		
Total Suspended Solids	mg/L	NA			NA			36.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-08

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1215

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10376-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEL12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/17/2012

% Moisture: not dec. Date Analyzed: 04/17/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	4.4	J
108-90-7	Chlorobenzene	12	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-08

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1215

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10376-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEL11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/17/2012

% Moisture: not dec. Date Analyzed: 04/17/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	18	
108-90-7	Chlorobenzene	2.1	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04132012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1215

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10376-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEL13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/17/2012

% Moisture: not dec. Date Analyzed: 04/17/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-22 Lab Sample ID: 200-10376-1

Lab Name: TestAmerica Burlington Job No.: 200-10376-2

SDG ID.: PRR1215

Matrix: Water Date Sampled: 04/12/2012 17:40

Reporting Basis: WET Date Received: 04/17/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.5	0.50		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-23 Lab Sample ID: 200-10376-2

Lab Name: TestAmerica Burlington Job No.: 200-10376-2

SDG ID.: PRR1215

Matrix: Water Date Sampled: 04/13/2012 10:00

Reporting Basis: WET Date Received: 04/17/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.7	0.47		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-08 Lab Sample ID: 200-10376-3

Lab Name: TestAmerica Burlington Job No.: 200-10376-2

SDG ID.: PRR1215

Matrix: Water Date Sampled: 04/13/2012 10:15

Reporting Basis: WET Date Received: 04/17/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	259	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-08 Lab Sample ID: 200-10376-4

Lab Name: TestAmerica Burlington Job No.: 200-10376-2

SDG ID.: PRR1215

Matrix: Water Date Sampled: 04/13/2012 10:10

Reporting Basis: WET Date Received: 04/17/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	322	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-07 Lab Sample ID: 200-10376-6

Lab Name: TestAmerica Burlington Job No.: 200-10376-2

SDG ID.: PRR1215

Matrix: Water Date Sampled: 04/13/2012 10:20

Reporting Basis: WET Date Received: 04/17/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	36.4	2.3		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-24 | Lab Sample ID: 200-10376-7

Lab Name: TestAmerica Burlington | Job No.: 200-10376-2

SDG ID.: PRR1215

Matrix: Water | Date Sampled: 04/14/2012 06:40

Reporting Basis: WET | Date Received: 04/17/2012 10:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.0	0.83		mg/L			1	SM 2540D

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1215	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-~~21~~ 22	4/12/2012	17:40	water	Grab	1			X															
PRR1WATCME-~~22~~ 23	4/13/2012	10:00	water	Grab	1			X															
PRR1WATGACI-08	4/13/2012	10:15	water	Grab	4	X	X																
PRR1WATGACE-08	4/13/2012	10:10	water	Grab	4	X	X																
TB04132012	4/13/2012		water	—	3	X																	
PRR1WATSP101-07	4/13/2012	10:20	water	Grab	1			X															

RS 4/17/12

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	COD
3	TSS
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Triple volume submitted for PRR1WATGACE-05 for MS/MSD

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.0°C ok!

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/13/12	1745				
	4/13/12	1800	TABR 4/17/12 1025			

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1215	

SAMPLERS:

SAMPLE ID (RS 4/17/12)	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-25 24	4/14/2012	6:40	water	Grab	1	X																	

Page 17 of 106

Requested Analyses	
1	TSS
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

X: Analyze Now

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.0°C OK!

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[illegible]	4/16/12	0700				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

04/24/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1219 (200-10392)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17224R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1219 (200-10392) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-25	200-10392-1	Water	4/17/2012						X
PRR1WATCME-26	200-10392-2	Water	4/17/2012						X
PRR1WATGACI-09	200-10392-3	Water	4/17/2012		X				X
PRR1WATGACE-09	200-10392-4	Water	4/17/2012		X				X
TB04172012	200-10392-5	Water	4/17/2012		X				
PRR1WATSP101-8	200-10392-6	Water	4/17/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. Chlorobenzene was detected in the laboratory method blank; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-09	Chlorobenzene	1400 E	1300 D	1300 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS and COD DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The COD results were qualified as estimated because the matrix spike recovery was less than the lower control limit. The COD results may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS or COD analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

MS determination was performed using sample PRR1WATGACE-09 for COD analysis. All analytes associated with MS recoveries were within the control limits with the exception of the following analytes present in the table below.

Sample Location	Analyte	MS Recovery
PRR1WATGACE-09	COD	38 %

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 the analytical batch.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

Sample PRR1WATGACE-09 was selected for the duplicate analysis for COD. The relative percent difference (RPD) between the sample and duplicate values obtained met the project measurement performance criteria.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x) dilution in order to

bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 20, 2012

PEER REVIEW: Dennis Capria

DATE: October 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1219 - VOCs

ANALYTE	Units	PRR1WATGACE-09	LQ	VQ	PRR1WATGACI-09	LQ	VQ
2-Butanone	ug/L	10	U	U	13	J	J
Chlorobenzene	ug/L	7.6			1300	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1219 - Miscellaneous

ANALYTE	Units	PRR1WATCME-25	LQ	VQ	PRR1WATCME-26	LQ	VQ	PRR1WATGACE-09	LQ	VQ
Chemical Oxygen Demand	mg/L	NA			NA			205		J
Total Suspended Solids	mg/L	7.2			8.1			NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1219 - Miscellaneous

ANALYTE	Units	PRR1WATGACI-09	LQ	VQ	PRR1WATSP101-8	LQ	VQ
Chemical Oxygen Demand	mg/L	346		J	NA		
Total Suspended Solids	mg/L	NA			35.6		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1219

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10392-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEM08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/18/2012

% Moisture: not dec. Date Analyzed: 04/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	7.6	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-09

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1219

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10392-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEM06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/18/2012

% Moisture: not dec. Date Analyzed: 04/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 11.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	13	J
108-90-7	Chlorobenzene	1300 ~~1400~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACI-09DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1219

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10392-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEM05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/18/2012

% Moisture: not dec. Date Analyzed: 04/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 88.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	440	U
108-90-7	Chlorobenzene	1300	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04172012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1219

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10392-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDEM09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/18/2012

% Moisture: not dec. Date Analyzed: 04/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-25 Lab Sample ID: 200-10392-1

Lab Name: TestAmerica Burlington Job No.: 200-10392-2

SDG ID.: PRR1219

Matrix: Water Date Sampled: 04/17/2012 20:15

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.2	0.67		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-26 Lab Sample ID: 200-10392-2

Lab Name: TestAmerica Burlington Job No.: 200-10392-2

SDG ID.: PRR1219

Matrix: Water Date Sampled: 04/17/2012 10:35

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	8.1	0.53		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACI-09 Lab Sample ID: 200-10392-3

Lab Name: TestAmerica Burlington Job No.: 200-10392-2

SDG ID.: PRR1219

Matrix: Water Date Sampled: 04/17/2012 10:30

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	346	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATGACE-09 Lab Sample ID: 200-10392-4

Lab Name: TestAmerica Burlington Job No.: 200-10392-2

SDG ID.: PRR1219

Matrix: Water Date Sampled: 04/17/2012 10:25

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Chemical Oxygen Demand	205	80.0		mg/L		J	4	410.4

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP101-8 Lab Sample ID: 200-10392-6

Lab Name: TestAmerica Burlington Job No.: 200-10392-2

SDG ID.: PRR1219

Matrix: Water Date Sampled: 04/17/2012 10:40

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	35.6	2.0		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1219	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-25	4/16/2012	20:15	water	Grab	1			X															
PRR1WATCME-26	4/17/2012	10:35	water	Grab	1			X															
PRR1WATGACI-09	4/17/2012	10:30	water	Grab	4	X	X																
PRR1WATGACE-09	4/17/2012	10:25	water	Grab	4	X	X																
TB04172012	4/17/2012	--	water	--	3	X																	
PRR1WATSP101-8	4/17/2012	10:40	water	Grab	1			X															

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	COD
3	TSS
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.4°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/17/12	1745	[signature]			
[signature]	4/17/12	1800	[signature] 04/18/12 1020			

Page 7 of 114

04/24/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals, Grain Size and Miscellaneous Analyses

SDG# PRR1220 (200-10396)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17231R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1220 (200-10396) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1SOLBF-01	200-10396-1	Soil	4/17/2012			X	X	X	X
PRR1SOLBF-02	200-10396-2	Soil	4/17/2012			X	X	X	X
PRR1SOLBF-03	200-10396-3	Soil	4/17/2012			X	X	X	X
PRR1SOLBF-04	200-10396-4	Soil	4/17/2012			X	X	X	X
PRR1SOLBF-05	200-10396-5	Soil	4/17/2012			X	X	X	X
PRR1SOLBF-06	200-10396-6	Soil	4/17/2012			X	X	X	X
PRR1SOLBF-01	200-10425-1	Soil	4/20/2012		X				
PRR1SOLBF-02	200-10425-2	Soil	4/20/2012		X				
PRR1SOLBF-03	200-10425-3	Soil	4/20/2012		X				
PRR1SOLBF-04	200-10425-4	Soil	4/20/2012		X				
PRR1SOLBF-05	200-10425-5	Soil	4/20/2012		X				
PRR1SOLBF-06	200-10425-6	Soil	4/20/2012		X				
TB04172012	200-10425-7	Water	4/20/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. SVOC – Semivolatile Organic Compounds by USEPA Method SOM0.1.2
3. PEST/PCB – Pesticides and PCBs by USEPA Method SOM01.2, and Chlorinated Herbicides by USEPA SW846 Method 8151A
4. MET - Metals by USEPA Method ISM01.2
5. MISC – pH by USEPA 9045C and Grain Size by ASTM D422

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank or field blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as 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).

Sample Location	Compound	Sample Result	Qualification
PRR1SOLBF-01 PRR1SOLBF-02	Methylene chloride Toluene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene	Detected sample results > RL and < BAL	“UB” at detected sample concentration

Sample Location	Compound	Sample Result	Qualification
PRR1SOLBF-03 PRR1SOLBF-04 PRR1SOLBF-05	Methylene chloride Toluene	Detected sample results > RL and < BAL	"UB" at detected sample concentration
PRR1SOLBF-06	Toluene		

RL = reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. All compounds associated with the MS/MSD analyses exhibited acceptable recoveries and relative percent differences (RPDs) between the MS and MSD results.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during SVOC analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1SOLBF-01 PRR1SOLBF-03 PRR1SOLBF-06	Benzaldehyde	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Compound	MS Recovery	MSD Recovery
PRR1SOLBF-02	Pentachlorophenol	< 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 MS/MSD deviations, 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 > 4x the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSDs exhibiting RPDs greater than of the control limit are presented in the following table.

Sample Location	Compound
PRR1SOLBF-02	Pentachlorophenol

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

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

Several detected pesticides exhibited results that exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during pesticides analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1SOLBF-01	beta-BHC gamma-Chlordane	Detected sample results < RL and < BAL	"UB" at the RL
PRR1SOLBF-02	alpha-BHC beta-BHC gamma-Chlordane		
PRR1SOLBF-03 PRR1SOLBF-05	alpha-BHC beta-BHC Methoxychlor gamma-Chlordane		
PRR1SOLBF-04 PRR1SOLBF-06	alpha-BHC beta-BHC Methoxychlor		

RL Reporting limit

3. SURROGATES

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.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. All compounds associated with the MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

5. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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

field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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 Location	Compound	%D
PRR1SOLBF-01	Aldrin	140.1 %
	alpha-Chlordane	54.9 %
PRR1SOLBF-01 (modified method)	2,4'-DDE	149.7 %
PRR1SOLBF-02	Heptachlor	298.3 %
	alpha-Chlordane	66.8 %
PRR1SOLBF-02 (modified method)	2,4'-DDE	186.7 %
PRR1SOLBF-03	gamma-BHC	323.4 %
	alpha-Chlordane	356.7 %
PRR1SOLBF-04	Endosulfan sulfate	55.6 %
PRR1SOLBF-05	alpha-Chlordane	54.7 %
PRR1SOLBF-06	2,4'-DDE	137.6 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blanks or field blank at or above the PQL during PCB analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. All compounds associated with the

MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

5. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during herbicides analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. All compounds associated with the MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

5. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan for all non-detected analytes.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The nickel result for sample location PRR1WATCME-21 was qualified as estimated due to serial dilution percent difference exceedance. The nickel result may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during metals analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1SOLBF-03 PRR1SOLBF-06	Beryllium	Detected sample results < RL and < BAL	"UB" at the RL
PRR1SOLBF-04	Barium Beryllium		

RL Reporting limit

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS analysis is performed to determine the accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. All analytes associated with MS recoveries were within the control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery
PRR1SOLBF-02	Manganese	73 %

The criteria used to evaluate MS recoveries are presented in the following table. In the case of MS deviations, the sample results are qualified. The qualifications are applied to all sample results associated with this analytical batch.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data. A control limit of 20% for water matrices and 35% for soil matrices is applied to concentrations that are at least five times the reporting limit (RL). 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.

Sample location PRR1SOLBF-02 was used in the laboratory duplicate sample analysis. All analytes associated with laboratory duplicate sample RPDs were within the specified control limit.

6. 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.

Sample location PRR1SOLBF-02 was used in the serial dilution analysis. All serial dilutions were within the control limits, with the exception of the analyte presented in the following table. The nickel result for the diluted sample was greater than the nickel result for the undiluted sample.

Sample Location	Analyte	Serial Dilution (%D)
PRR1SOLBF-02	Iron	14 %

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. The qualifications are applied to all sample results associated with this analytical batch.

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

7. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

11. Overall Assessment

Overall 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.

PH DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within seven days, which is acceptable.

2. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was performed using sample location PRR1SOLBF-02. The laboratory duplicate sample results exhibited a RPD within the control limit.

3. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

4. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

5. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

6. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
HF	Field parameter with a holding time of 15 minutes.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

The laboratory added the qualifier "HF" which is defined by the laboratory as "a field parameter with a holding time of 15 minutes." Since the acceptable standard holding time is seven days, this qualifier has been removed.

7. Overall Assessment

Overall 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.

GRAIN SIZE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was performed using sample location PRR1SOLBF-02. The laboratory duplicate sample results exhibited a RPD within the control limit.

2. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

3. Reporting

This SDG does not contain re-extraction, re-analysis or dilution.

4. Standard data qualifiers

Data Validation/Laboratory qualifiers are not applicable when reporting sample results for geotechnical parameters.

5. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 20, 2012

PEER REVIEW: Dennis Capria

DATE: October 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - PCBs

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
Aroclor-1016	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1221	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1232	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1242	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1248	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1254	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1260	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1262	ug/kg	34	U	U	33	U	U	34	U	U
Aroclor-1268	ug/kg	34	U	U	33	U	U	34	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - PCBs

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
Aroclor-1016	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1221	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1232	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1242	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1248	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1254	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1260	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1262	ug/kg	34	U	U	33	U	U	33	U	U
Aroclor-1268	ug/kg	34	U	U	33	U	U	33	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Pesticides

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
2,4'-DDD	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
2,4'-DDE	ug/kg	3.3	J P	U	3.2	J P	U	3.3	U	U
2,4'-DDT	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
4,4'-DDD	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
4,4'-DDE	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
4,4'-DDT	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
Aldrin	ug/kg	1.7	J P	U	1.7	U	U	1.7	U	U
Alpha-BHC	ug/kg	1.7	U	U	1.7	J P B	UB	1.7	J P B	UB
Alpha-Chlordane	ug/kg	1.7	J P	U	1.7	J P	U	1.7	J P	U
Beta-BHC	ug/kg	1.7	J P B	UB	1.7	J P B	UB	1.7	J P B	UB
Delta-BHC	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Dieldrin	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
Endosulfan I	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Endosulfan II	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
Endosulfan Sulfate	ug/kg	3.3	U	U	3.2	U	U	0.091	J	J
Endrin	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
Endrin Aldehyde	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
Endrin Ketone	ug/kg	3.3	U	U	3.2	U	U	3.3	U	U
Gamma-BHC (Lindane)	ug/kg	1.7	U	U	1.7	U	U	1.7	J P	U
Gamma-Chlordane	ug/kg	1.7	J P B	UB	1.7	J P B	UB	1.7	J P B	UB
Heptachlor	ug/kg	0.038	J P	J	1.7	J P	U	0.049	J	J
Heptachlor Epoxide	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Methoxychlor	ug/kg	17	U	U	17	U	U	17	J P B	UB
Toxaphene	ug/kg	170	U	U	170	U	U	170	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Pesticides

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
2,4'-DDD	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
2,4'-DDE	ug/kg	3.3	U	U	3.3	U	U	3.2	J P	U
2,4'-DDT	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
4,4'-DDD	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
4,4'-DDE	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
4,4'-DDT	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
Aldrin	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Alpha-BHC	ug/kg	1.7	J P B	UB	1.7	J P B	UB	1.7	J P B	UB
Alpha-Chlordane	ug/kg	1.7	U	U	1.7	J P	U	1.7	U	U
Beta-BHC	ug/kg	1.7	J P B	UB	1.7	J P B	UB	1.7	J B	UB
Delta-BHC	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Dieldrin	ug/kg	0.11	J	J	3.3	U	U	3.2	U	U
Endosulfan I	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Endosulfan II	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
Endosulfan Sulfate	ug/kg	3.3	J P	U	3.3	J P	U	3.2	U	U
Endrin	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
Endrin Aldehyde	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
Endrin Ketone	ug/kg	3.3	U	U	3.3	U	U	3.2	U	U
Gamma-BHC (Lindane)	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Gamma-Chlordane	ug/kg	1.7	U	U	1.7	J P B	UB	1.7	U	U
Heptachlor	ug/kg	0.048	J	J	1.7	J P	U	0.029	J P	J
Heptachlor Epoxide	ug/kg	1.7	U	U	1.7	U	U	1.7	U	U
Methoxychlor	ug/kg	17	J P B	UB	17	J P B	UB	17	J P B	UB
Toxaphene	ug/kg	170	U	U	170	U	U	170	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Herbicides

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
2,4,5-T	ug/kg	9.6	U	U	9.5	U	U	9.7	U	U
2,4,5-TP	ug/kg	3.8	U	U	3.8	U	U	3.9	U	U
2,4-D	ug/kg	38	U	U	38	U	U	39	U	U
2,4-DB	ug/kg	19	U	U	19	U	U	19	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Herbicides

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
2,4,5-T	ug/kg	13			9.5	U	U	2.3	J	J
2,4,5-TP	ug/kg	3.8	U	U	3.8	U	U	3.8	U	U
2,4-D	ug/kg	22	J	J	38	U	U	38	U	U
2,4-DB	ug/kg	19	U	U	19	U	U	19	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - VOCs

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
1,1,1-Trichloroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,1,2,2-Tetrachloroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,1,2-trichloro-1,2,2-trifluoroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,1,2-Trichloroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,1-Dichloroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,1-Dichloroethene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,2,3-Trichlorobenzene	ug/kg	3.2	J B	UB	3.1	J B	UB	3.6	U	U
1,2,4-Trichlorobenzene	ug/kg	3.2	J B	UB	3.1	J B	UB	3.6	U	U
1,2-Dibromo-3-chloropropane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,2-Dibromoethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,2-Dichlorobenzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,2-Dichloroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,2-Dichloropropane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,3-Dichlorobenzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,4-Dichlorobenzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
1,4-Dioxane	ug/kg	65	U	U	63	U	U	72	U	U
2-Butanone	ug/kg	6.5	U	U	6.3	U	U	7.2	U	U
2-Hexanone	ug/kg	6.5	U	U	6.3	U	U	7.2	U	U
4-Methyl-2-pentanone	ug/kg	6.5	U	U	6.3	U	U	7.2	U	U
Acetone	ug/kg	6.5	U	U	6.3	U	U	7.2	U	U
Benzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Bromochloromethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Bromodichloromethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Bromoform	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Bromomethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Carbon Disulfide	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Carbon Tetrachloride	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Chlorobenzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Chloroethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Chloroform	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Chloromethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
cis-1,2-Dichloroethene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
cis-1,3-Dichloropropene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - VOCs

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
Cyclohexane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Dibromochloromethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Dichlorodifluoromethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Ethylbenzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Isopropylbenzene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
m&p-Xylene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Methyl acetate	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Methyl tert-butyl ether	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Methylcyclohexane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Methylene Chloride	ug/kg	3.2	J B	UB	3.1	J B	UB	3.6	J B	UB
o-Xylene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Styrene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Tetrachloroethene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Toluene	ug/kg	3.2	J B	UB	3.1	J B	UB	3.6	J B	UB
trans-1,2-Dichloroethene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
trans-1,3-Dichloropropene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Trichloroethene	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Trichlorofluoromethane	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U
Vinyl Chloride	ug/kg	3.2	U	U	3.1	U	U	3.6	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - VOCs

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
1,1,1-Trichloroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,1,2,2-Tetrachloroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,1,2-trichloro-1,2,2-trifluoroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,1,2-Trichloroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,1-Dichloroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,1-Dichloroethene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2,3-Trichlorobenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2,4-Trichlorobenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2-Dibromo-3-chloropropane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2-Dibromoethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2-Dichlorobenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2-Dichloroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,2-Dichloropropane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,3-Dichlorobenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,4-Dichlorobenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
1,4-Dioxane	ug/kg	76	U	U	53	U	U	65	U	U
2-Butanone	ug/kg	7.6	U	U	5.3	U	U	6.5	U	U
2-Hexanone	ug/kg	7.6	U	U	5.3	U	U	6.5	U	U
4-Methyl-2-pentanone	ug/kg	7.6	U	U	5.3	U	U	6.5	U	U
Acetone	ug/kg	7.6	U	U	5.3	U	U	6.5	U	U
Benzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Bromochloromethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Bromodichloromethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Bromoform	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Bromomethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Carbon Disulfide	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Carbon Tetrachloride	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Chlorobenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Chloroethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Chloroform	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Chloromethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
cis-1,2-Dichloroethene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
cis-1,3-Dichloropropene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - VOCs

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
Cyclohexane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Dibromochloromethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Dichlorodifluoromethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Ethylbenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Isopropylbenzene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
m&p-Xylene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Methyl acetate	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Methyl tert-butyl ether	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Methylcyclohexane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Methylene Chloride	ug/kg	3.8	J B	UB	2.7	J B	UB	3.2	U	U
o-Xylene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Styrene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Tetrachloroethene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Toluene	ug/kg	3.8	J B	UB	2.7	J B	UB	3.2	J B	UB
trans-1,2-Dichloroethene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
trans-1,3-Dichloropropene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Trichloroethene	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Trichlorofluoromethane	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U
Vinyl Chloride	ug/kg	3.8	U	U	2.7	U	U	3.2	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
1,1'-Biphenyl	ug/kg	170	U	U	170	U	U	170	U	U
1,2,4,5-Tetrachlorobenzene	ug/kg	170	U	U	170	U	U	170	U	U
2,2'-Oxybis(1-Chloropropane)	ug/kg	170	U	U	170	U	U	170	U	U
2,3,4,6-Tetrachlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4,5-Trichlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4,6-Trichlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4-Dichlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4-Dimethylphenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4-Dinitrophenol	ug/kg	330	U	U	320	U	U	330	U	U
2,4-Dinitrotoluene	ug/kg	170	U	U	170	U	U	170	U	U
2,6-Dinitrotoluene	ug/kg	170	U	U	170	U	U	170	U	U
2-Chloronaphthalene	ug/kg	170	U	U	170	U	U	170	U	U
2-Chlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2-Methylnaphthalene	ug/kg	170	U	U	170	U	U	170	U	U
2-Methylphenol	ug/kg	170	U	U	170	U	U	170	U	U
2-Nitroaniline	ug/kg	330	U	U	320	U	U	330	U	U
2-Nitrophenol	ug/kg	170	U	U	170	U	U	170	U	U
3,3'-Dichlorobenzidine	ug/kg	170	U	U	170	U	U	170	U	U
3-Nitroaniline	ug/kg	330	U	U	320	U	U	330	U	U
4,6-Dinitro-2-methylphenol	ug/kg	330	U	U	320	U	U	330	U	U
4-Bromophenyl-phenylether	ug/kg	170	U	U	170	U	U	170	U	U
4-Chloro-3-Methylphenol	ug/kg	170	U	U	170	U	U	170	U	U
4-Chloroaniline	ug/kg	170	U	U	170	U	U	170	U	U
4-Chlorophenyl-phenylether	ug/kg	170	U	U	170	U	U	170	U	U
4-Methylphenol	ug/kg	170	U	U	170	U	U	170	U	U
4-Nitroaniline	ug/kg	330	U	U	320	U	U	330	U	U
4-Nitrophenol	ug/kg	330	U	U	320	U	U	330	U	U
Acenaphthene	ug/kg	170	U	U	170	U	U	170	U	U
Acenaphthylene	ug/kg	170	U	U	170	U	U	170	U	U
Acetophenone	ug/kg	170	U	U	26	J	J	35	J	J
Anthracene	ug/kg	170	U	U	170	U	U	170	U	U
Atrazine	ug/kg	170	U	U	170	U	U	170	U	U
Benzaldehyde	ug/kg	170	J B	UB	170	U	U	170	J B	UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
Benzo(a)anthracene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(a)pyrene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(b)fluoranthene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(g,h,i)perylene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(k)fluoranthene	ug/kg	170	U	U	170	U	U	170	U	U
bis(2-Chloroethoxy)methane	ug/kg	170	U	U	170	U	U	170	U	U
bis(2-Chloroethyl)ether	ug/kg	170	U	U	170	U	U	170	U	U
bis(2-Ethylhexyl)phthalate	ug/kg	170	U	U	170	U	U	23	J	J
Butylbenzylphthalate	ug/kg	170	U	U	170	U	U	8.4	J	J
Caprolactam	ug/kg	170	U	U	170	U	U	170	U	U
Carbazole	ug/kg	170	U	U	170	U	U	170	U	U
Chrysene	ug/kg	170	U	U	170	U	U	170	U	U
Dibenzo(a,h)anthracene	ug/kg	170	U	U	170	U	U	170	U	U
Dibenzofuran	ug/kg	170	U	U	170	U	U	170	U	U
Diethylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Dimethylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Di-n-Butylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Di-n-Octylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Fluoranthene	ug/kg	170	U	U	170	U	U	170	U	U
Fluorene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachlorobenzene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachlorobutadiene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachlorocyclopentadiene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachloroethane	ug/kg	170	U	U	170	U	U	170	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	170	U	U	170	U	U	170	U	U
Isophorone	ug/kg	170	U	U	170	U	U	170	U	U
Naphthalene	ug/kg	170	U	U	170	U	U	170	U	U
Nitrobenzene	ug/kg	170	U	U	170	U	U	170	U	U
N-Nitroso-di-n-propylamine	ug/kg	170	U	U	170	U	U	170	U	U
N-Nitrosodiphenylamine	ug/kg	170	U	U	170	U	U	170	U	U
Pentachlorophenol	ug/kg	330	U	U	320	U	U	330	U	U
Phenanthrene	ug/kg	170	U	U	170	U	U	170	U	U
Phenol	ug/kg	170	U	U	16	J	J	22	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
Pyrene	ug/kg	170	U	U	170	U	U	170	U	U
Pyridine	ug/kg	170	U	U	170	U	U	170	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
1,1'-Biphenyl	ug/kg	170	U	U	170	U	U	170	U	U
1,2,4,5-Tetrachlorobenzene	ug/kg	170	U	U	170	U	U	170	U	U
2,2'-Oxybis(1-Chloropropane)	ug/kg	170	U	U	170	U	U	170	U	U
2,3,4,6-Tetrachlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4,5-Trichlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4,6-Trichlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4-Dichlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4-Dimethylphenol	ug/kg	170	U	U	170	U	U	170	U	U
2,4-Dinitrophenol	ug/kg	320	U	U	330	U	U	330	U	U
2,4-Dinitrotoluene	ug/kg	170	U	U	170	U	U	170	U	U
2,6-Dinitrotoluene	ug/kg	170	U	U	170	U	U	170	U	U
2-Chloronaphthalene	ug/kg	170	U	U	170	U	U	170	U	U
2-Chlorophenol	ug/kg	170	U	U	170	U	U	170	U	U
2-Methylnaphthalene	ug/kg	170	U	U	170	U	U	170	U	U
2-Methylphenol	ug/kg	170	U	U	170	U	U	170	U	U
2-Nitroaniline	ug/kg	320	U	U	330	U	U	330	U	U
2-Nitrophenol	ug/kg	170	U	U	170	U	U	170	U	U
3,3'-Dichlorobenzidine	ug/kg	170	U	U	170	U	U	170	U	U
3-Nitroaniline	ug/kg	320	U	U	330	U	U	330	U	U
4,6-Dinitro-2-methylphenol	ug/kg	320	U	U	330	U	U	330	U	U
4-Bromophenyl-phenylether	ug/kg	170	U	U	170	U	U	170	U	U
4-Chloro-3-Methylphenol	ug/kg	170	U	U	170	U	U	170	U	U
4-Chloroaniline	ug/kg	170	U	U	170	U	U	170	U	U
4-Chlorophenyl-phenylether	ug/kg	170	U	U	170	U	U	170	U	U
4-Methylphenol	ug/kg	170	U	U	170	U	U	170	U	U
4-Nitroaniline	ug/kg	320	U	U	330	U	U	330	U	U
4-Nitrophenol	ug/kg	320	U	U	330	U	U	330	U	U
Acenaphthene	ug/kg	170	U	U	170	U	U	170	U	U
Acenaphthylene	ug/kg	170	U	U	170	U	U	170	U	U
Acetophenone	ug/kg	29	J	J	23	J	J	28	J	J
Anthracene	ug/kg	170	U	U	170	U	U	170	U	U
Atrazine	ug/kg	170	U	U	170	U	U	170	U	U
Benzaldehyde	ug/kg	170	U	U	170	U	U	170	J B	UB

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
Benzo(a)anthracene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(a)pyrene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(b)fluoranthene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(g,h,i)perylene	ug/kg	170	U	U	170	U	U	170	U	U
Benzo(k)fluoranthene	ug/kg	170	U	U	170	U	U	170	U	U
bis(2-Chloroethoxy)methane	ug/kg	170	U	U	170	U	U	170	U	U
bis(2-Chloroethyl)ether	ug/kg	170	U	U	170	U	U	170	U	U
bis(2-Ethylhexyl)phthalate	ug/kg	27	J	J	170	U	U	170	U	U
Butylbenzylphthalate	ug/kg	7.9	J	J	170	U	U	5.5	J	J
Caprolactam	ug/kg	170	U	U	170	U	U	170	U	U
Carbazole	ug/kg	170	U	U	170	U	U	170	U	U
Chrysene	ug/kg	170	U	U	170	U	U	170	U	U
Dibenzo(a,h)anthracene	ug/kg	170	U	U	170	U	U	170	U	U
Dibenzofuran	ug/kg	170	U	U	170	U	U	170	U	U
Diethylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Dimethylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Di-n-Butylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Di-n-Octylphthalate	ug/kg	170	U	U	170	U	U	170	U	U
Fluoranthene	ug/kg	170	U	U	170	U	U	170	U	U
Fluorene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachlorobenzene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachlorobutadiene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachlorocyclopentadiene	ug/kg	170	U	U	170	U	U	170	U	U
Hexachloroethane	ug/kg	170	U	U	170	U	U	170	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	170	U	U	170	U	U	170	U	U
Isophorone	ug/kg	170	U	U	170	U	U	170	U	U
Naphthalene	ug/kg	170	U	U	170	U	U	170	U	U
Nitrobenzene	ug/kg	170	U	U	170	U	U	170	U	U
N-Nitroso-di-n-propylamine	ug/kg	170	U	U	170	U	U	170	U	U
N-Nitrosodiphenylamine	ug/kg	170	U	U	170	U	U	170	U	U
Pentachlorophenol	ug/kg	320	U	U	330	U	U	330	U	U
Phenanthrene	ug/kg	170	U	U	170	U	U	170	U	U
Phenol	ug/kg	15	J	J	170	U	U	14	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
Pyrene	ug/kg	170	U	U	170	U	U	170	U	U
Pyridine	ug/kg	170	U	U	170	U	U	170	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs - SIM

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
2-Methylnaphthalene	ug/kg	3.3	U	U	0.11	J	J	0.18	J	J
Acenaphthene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Acenaphthylene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Anthracene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Benzo(a)anthracene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Benzo(a)pyrene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Benzo(b)fluoranthene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Benzo(g,h,i)perylene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Benzo(k)fluoranthene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Chrysene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Dibenzo(a,h)anthracene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Fluoranthene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Fluorene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Hexachlorobenzene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	3.3	U	U	3.3	U	U	3.4	U	U
Naphthalene	ug/kg	0.23	J	J	0.25	J	J	0.38	J	J
Pentachlorophenol	ug/kg	6.7	U	U	6.7	U	UJ	6.8	U	U
Phenanthrene	ug/kg	0.11	J	J	0.092	J	J	0.12	J	J
Pyrene	ug/kg	3.3	U	U	3.3	U	U	0.17	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - SVOCs - SIM

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
2-Methylnaphthalene	ug/kg	0.16	J	J	0.17	J	J	0.18	J	J
Acenaphthene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Acenaphthylene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Anthracene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Benzo(a)anthracene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Benzo(a)pyrene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Benzo(b)fluoranthene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Benzo(g,h,i)perylene	ug/kg	3.3	U	U	3.3	U	U	0.089	J	J
Benzo(k)fluoranthene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Chrysene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Dibenzo(a,h)anthracene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Fluoranthene	ug/kg	3.3	U	U	0.086	J	J	0.11	J	J
Fluorene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Hexachlorobenzene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Indeno(1,2,3-cd)pyrene	ug/kg	3.3	U	U	3.3	U	U	3.3	U	U
Naphthalene	ug/kg	0.33	J	J	0.32	J	J	0.35	J	J
Pentachlorophenol	ug/kg	6.7	U	U	6.7	U	U	6.8	U	U
Phenanthrene	ug/kg	0.13	J	J	0.16	J	J	0.19	J	J
Pyrene	ug/kg	0.1	J	J	0.14	J	J	0.2	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Inorganics

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
Aluminum	mg/kg	338	*		461	*		395	*	
Antimony	mg/kg	4.4	U	U	4.6	U	U	4.5	U	U
Arsenic	mg/kg	3.7			3.7			2.8		
Barium	mg/kg	4	J	J	2.6	J	J	2.8	J	J
Beryllium	mg/kg	0.15	J	J	0.13	J	J	0.38	J	UB
Cadmium	mg/kg	0.09	J	J	0.1	J	J	0.08	J	J
Calcium	mg/kg	187000			190000			195000		
Chromium	mg/kg	2.6			2.7			2.6		
Cobalt	mg/kg	1.7	J	J	2.2	J	J	1.2	J	J
Copper	mg/kg	3.5			4			3.2		
Iron	mg/kg	4840	E	J	5330	E	J	3850	E	J
Lead	mg/kg	6.1			5.4			5		
Magnesium	mg/kg	107000			109000			112000		
Manganese	mg/kg	169	N	J	191	N	J	181	N	J
Mercury	mg/kg	0.095	U	U	0.093	U	U	0.011	J	J
Nickel	mg/kg	3.6			3.8			2.6	J	J
Potassium	mg/kg	276	J	J	331	J	J	264	J	J
Selenium	mg/kg	0.25	J	J	2.7	U	U	0.22	J	J
Silver	mg/kg	0.73	U	U	0.76	U	U	0.75	U	U
Sodium	mg/kg	122	J	J	129	J	J	128	J	J
Thallium	mg/kg	1.8	U	U	1.9	U	U	1.9	U	U
Vanadium	mg/kg	5.2			5.1			4.9		
Zinc	mg/kg	4.4	U	U	0.52	J	J	4.5	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Inorganics

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
Aluminum	mg/kg	281	*		430	*		472	*	
Antimony	mg/kg	4.3	U	U	4.1	U	U	4.1	U	U
Arsenic	mg/kg	3.6			3.7			3		
Barium	mg/kg	14.2	J	UB	2.6	J	J	3	J	J
Beryllium	mg/kg	0.36	J	UB	0.13	J	J	0.34	J	UB
Cadmium	mg/kg	0.079	J	J	0.082	J	J	0.067	J	J
Calcium	mg/kg	191000			191000			198000		
Chromium	mg/kg	2.5			2.8			2.5		
Cobalt	mg/kg	1.2	J	J	1.6	J	J	1.1	J	J
Copper	mg/kg	2.5			3.3			2.5		
Iron	mg/kg	3830	E	J	4570	E	J	3690	E	J
Lead	mg/kg	4.4			5			3.9		
Magnesium	mg/kg	110000			110000			113000		
Manganese	mg/kg	165	N	J	169	N	J	176	N	J
Mercury	mg/kg	0.095	U	U	0.093	U	U	0.099	U	U
Nickel	mg/kg	2.4	J	J	3.2			2.3	J	J
Potassium	mg/kg	218	J	J	318	J	J	212	J	J
Selenium	mg/kg	0.32	J	J	2.4	U	U	2.4	U	U
Silver	mg/kg	0.71	U	U	0.68	U	U	0.68	U	U
Sodium	mg/kg	134	J	J	130	J	J	133	J	J
Thallium	mg/kg	1.8	U	U	1.7	U	U	1.7	U	U
Vanadium	mg/kg	4.5			5.1			4.9		
Zinc	mg/kg	4.3	U	U	4.1	U	U	4.1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Miscellaneous

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
Percent Moisture	%	0.45			0.27			1.7		
Percent Solids	%	99.5			99.7			98.3		
pH	SU	9.05	HF		9.21	HF		9.28	HF	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Miscellaneous

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
Percent Moisture	%	0.98			0.43			0.6		
Percent Solids	%	99			99.6			99.4		
pH	SU	9.24	HF		9.28	HF		9.35	HF	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Grain Size

ANALYTE	Units	PRR1SOLBF-01
Gravel	%	7.3
Sand	%	91.7
Coarse Sand	%	74
Medium Sand	%	17.1
Fine Sand	%	0.6
Silt	%	0.4
Clay	%	0.6
Sieve		
75000 um	% passing	100
50000 um	% passing	100
37500 um	% passing	100
25000 um	% passing	100
19000 um	% passing	100
9500 um	% passing	100
4750 um	% passing	92.7
2000 um	% passing	18.7
850 um	% passing	3.3
425 um	% passing	1.6
250 um	% passing	1.3
180 um	% passing	1.2
150 um	% passing	1.1
75 um	% passing	1
Hydrometer		
36.8 um	% passing	0.6
23.3 um	% passing	0.6
13.5 um	% passing	0.6
9.9 um	% passing	0.6
6.9 um	% passing	0.6
3.4 um	% passing	0.5
1.4 um	% passing	0.5

ANALYTE	Units	PRR1SOLBF-02
Gravel	%	4.6
Sand	%	94.1
Coarse Sand	%	75.3
Medium Sand	%	17.7
Fine Sand	%	1.2
Silt	%	0.7
Clay	%	0.5
Sieve		
75000 um	% passing	100
50000 um	% passing	100
37500 um	% passing	100
25000 um	% passing	100
19000 um	% passing	100
9500 um	% passing	100
4750 um	% passing	95.4
2000 um	% passing	20.1
850 um	% passing	4.9
425 um	% passing	2.4
250 um	% passing	1.8
180 um	% passing	1.6
150 um	% passing	1.5
75 um	% passing	1.3
Hydrometer		
37.0 um	% passing	0.6
23.4 um	% passing	0.6
13.5 um	% passing	0.6
9.7 um	% passing	0.6
6.6 um	% passing	0.5
3.3 um	% passing	0.5
1.4 um	% passing	0.5

ANALYTE	Units	PRR1SOLBF-03
Gravel	%	4.6
Sand	%	94
Coarse Sand	%	69.9
Medium Sand	%	21.2
Fine Sand	%	2.9
Silt	%	0.9
Clay	%	0.5
Sieve		
75000 um	% passing	100
50000 um	% passing	100
37500 um	% passing	100
25000 um	% passing	100
19000 um	% passing	100
9500 um	% passing	100
4750 um	% passing	95.4
2000 um	% passing	25.5
850 um	% passing	8.4
425 um	% passing	4.3
250 um	% passing	2.9
180 um	% passing	2.3
150 um	% passing	2.1
75 um	% passing	1.4
Hydrometer		
37.0 um	% passing	0.6
23.4 um	% passing	0.6
13.5 um	% passing	0.6
9.5 um	% passing	0.5
6.9 um	% passing	0.5
3.5 um	% passing	0.5
1.4 um	% passing	0.5

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1220 - Grain Size

ANALYTE	Units	PRR1SOLBF-04
Gravel	%	7.2
Sand	%	91.3
Coarse Sand	%	75.9
Medium Sand	%	14.6
Fine Sand	%	0.7
Silt	%	1
Clay	%	0.5
Sieve		
75000 um	% passing	100
50000 um	% passing	100
37500 um	% passing	100
25000 um	% passing	100
19000 um	% passing	100
9500 um	% passing	100
4750 um	% passing	92.8
2000 um	% passing	16.9
850 um	% passing	4.2
425 um	% passing	2.3
250 um	% passing	2
180 um	% passing	1.9
150 um	% passing	1.8
75 um	% passing	1.6
Hydrometer		
37.0 um	% passing	0.6
23.4 um	% passing	0.6
13.5 um	% passing	0.6
9.5 um	% passing	0.5
6.9 um	% passing	0.5
3.3 um	% passing	0.5
1.4 um	% passing	0.5

ANALYTE	Units	PRR1SOLBF-05
Gravel	%	9.1
Sand	%	90
Coarse Sand	%	76.9
Medium Sand	%	12.7
Fine Sand	%	0.4
Silt	%	0.3
Clay	%	0.6
Sieve		
75000 um	% passing	100
50000 um	% passing	100
37500 um	% passing	100
25000 um	% passing	100
19000 um	% passing	100
9500 um	% passing	100
4750 um	% passing	90.9
2000 um	% passing	14
850 um	% passing	2.9
425 um	% passing	1.3
250 um	% passing	1.1
180 um	% passing	1
150 um	% passing	1
75 um	% passing	0.9
Hydrometer		
37.2 um	% passing	0.6
23.5 um	% passing	0.6
13.6 um	% passing	0.6
9.3 um	% passing	0.6
6.8 um	% passing	0.6
3.3 um	% passing	0.5
1.4 um	% passing	0.5

ANALYTE	Units	PRR1SOLBF-06
Gravel	%	6.2
Sand	%	92.4
Coarse Sand	%	77.3
Medium Sand	%	14.4
Fine Sand	%	0.7
Silt	%	0.9
Clay	%	0.5
Sieve		
75000 um	% passing	100
50000 um	% passing	100
37500 um	% passing	100
25000 um	% passing	100
19000 um	% passing	100
9500 um	% passing	100
4750 um	% passing	93.8
2000 um	% passing	16.5
850 um	% passing	3.9
425 um	% passing	2.1
250 um	% passing	1.8
180 um	% passing	1.7
150 um	% passing	1.7
75 um	% passing	1.4
Hydrometer		
37.2 um	% passing	0.6
23.5 um	% passing	0.6
13.6 um	% passing	0.6
9.6 um	% passing	0.6
6.7 um	% passing	0.5
3.3 um	% passing	0.5
1.4 um	% passing	0.1

SAMPLE ANALYSIS DATA SHEETS AND COCs

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-1
% Solids: 99.5 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	338		~~*~~	P
7440-36-0	Antimony	4.4	U		P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	4.0	J		P
7440-41-7	Beryllium	0.15	J		P
7440-43-9	Cadmium	0.090	J		P
7440-70-2	Calcium	187000			P
7440-47-3	Chromium	2.6			P
7440-48-4	Cobalt	1.7	J		P
7440-50-8	Copper	3.5			P
7439-89-6	Iron	4840		~~E~~ J	P
7439-92-1	Lead	6.1			P
7439-95-4	Magnesium	107000			P
7439-96-5	Manganese	169		~~N~~ J	P
7440-02-0	Nickel	3.6			P
7440-09-7	Potassium	276	J		P
7782-49-2	Selenium	0.25	J		P
7440-22-4	Silver	0.73	U		P
7440-23-5	Sodium	122	J		P
7440-28-0	Thallium	1.8	U		P
7440-62-2	Vanadium	5.2			P
7440-66-6	Zinc	4.4	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: BROWN Clarity After: CLOUDY Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-1
% Solids: 99.5 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.095	U		CV

Color Before: BLACK Clarity Before: Texture: FINE
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-2
% Solids: 99.7 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	461			P
7440-36-0	Antimony	4.6	U		P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	2.6	J		P
7440-41-7	Beryllium	0.13	J		P
7440-43-9	Cadmium	0.10	J		P
7440-70-2	Calcium	190000			P
7440-47-3	Chromium	2.7			P
7440-48-4	Cobalt	2.2	J		P
7440-50-8	Copper	4.0			P
7439-89-6	Iron	5330		E J	P
7439-92-1	Lead	5.4			P
7439-95-4	Magnesium	109000			P
7439-96-5	Manganese	191		N J	P
7440-02-0	Nickel	3.8			P
7440-09-7	Potassium	331	J		P
7782-49-2	Selenium	2.7	U		P
7440-22-4	Silver	0.76	U		P
7440-23-5	Sodium	129	J		P
7440-28-0	Thallium	1.9	U		P
7440-62-2	Vanadium	5.1			P
7440-66-6	Zinc	0.52	J		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: BROWN Clarity After: CLOUDY Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-2
% Solids: 99.7 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.093	U		CV

Color Before: BLACK Clarity Before: Texture: FINE
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON | Contract: LPRSA
Lab Code: TABVT | Case No.: RAPHASI | Mod. Ref. No.: | SDG No.: PRR1220
Matrix: SOIL | Lab Sample Id: 200-10396-3
% Solids: 98.3 | Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	395		~~J~~	P
7440-36-0	Antimony	4.5	U		P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	2.8	J		P
7440-41-7	Beryllium	0.38 ~~0.11~~	~~J~~	UB	P
7440-43-9	Cadmium	0.080	J		P
7440-70-2	Calcium	195000			P
7440-47-3	Chromium	2.6			P
7440-48-4	Cobalt	1.2	J		P
7440-50-8	Copper	3.2			P
7439-89-6	Iron	3850		~~E~~ J	P
7439-92-1	Lead	5.0			P
7439-95-4	Magnesium	112000			P
7439-96-5	Manganese	181		~~N~~ J	P
7440-02-0	Nickel	2.6	J		P
7440-09-7	Potassium	264	J		P
7782-49-2	Selenium	0.22	J		P
7440-22-4	Silver	0.75	U		P
7440-23-5	Sodium	128	J		P
7440-28-0	Thallium	1.9	U		P
7440-62-2	Vanadium	4.9			P
7440-66-6	Zinc	4.5	U		P

Color Before: BROWN | Clarity Before: | Texture: MEDIUM
Color After: BROWN | Clarity After: CLOUDY | Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-3
% Solids: 98.3 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.011	J		CV

Color Before: BLACK Clarity Before: Texture: FINE
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-4
% Solids: 99.0 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	281		~~J~~	P
7440-36-0	Antimony	4.3	U		P
7440-38-2	Arsenic	3.6			P
7440-39-3	Barium	14 ~~2.1~~	~~J~~	UB	P
7440-41-7	Beryllium	0.36 ~~0.091~~	~~J~~	UB	P
7440-43-9	Cadmium	0.079	J		P
7440-70-2	Calcium	191000			P
7440-47-3	Chromium	2.5			P
7440-48-4	Cobalt	1.2	J		P
7440-50-8	Copper	2.5			P
7439-89-6	Iron	3830		~~E~~ J	P
7439-92-1	Lead	4.4			P
7439-95-4	Magnesium	110000			P
7439-96-5	Manganese	165		~~N~~ J	P
7440-02-0	Nickel	2.4	J		P
7440-09-7	Potassium	218	J		P
7782-49-2	Selenium	0.32	J		P
7440-22-4	Silver	0.71	U		P
7440-23-5	Sodium	134	J		P
7440-28-0	Thallium	1.8	U		P
7440-62-2	Vanadium	4.5			P
7440-66-6	Zinc	4.3	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: BROWN Clarity After: CLOUDY Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220

Matrix: SOIL Lab Sample Id: 200-10396-4

% Solids: 99.0 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.095	U		CV

Color Before: BLACK Clarity Before: Texture: FINE

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-5
% Solids: 99.6 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	430		~~*~~	P
7440-36-0	Antimony	4.1	U		P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	2.6	J		P
7440-41-7	Beryllium	0.13	J		P
7440-43-9	Cadmium	0.082	J		P
7440-70-2	Calcium	191000			P
7440-47-3	Chromium	2.8			P
7440-48-4	Cobalt	1.6	J		P
7440-50-8	Copper	3.3			P
7439-89-6	Iron	4570		~~E~~ J	P
7439-92-1	Lead	5.0			P
7439-95-4	Magnesium	110000			P
7439-96-5	Manganese	169		~~N~~ J	P
7440-02-0	Nickel	3.2			P
7440-09-7	Potassium	318	J		P
7782-49-2	Selenium	2.4	U		P
7440-22-4	Silver	0.68	U		P
7440-23-5	Sodium	130	J		P
7440-28-0	Thallium	1.7	U		P
7440-62-2	Vanadium	5.1			P
7440-66-6	Zinc	4.1	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: BROWN Clarity After: CLOUDY Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-5
% Solids: 99.6 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.093	U		CV

Color Before: BLACK Clarity Before: Texture: FINE
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-6
% Solids: 99.4 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	472		~~J~~	P
7440-36-0	Antimony	4.1	U		P
7440-38-2	Arsenic	3.0			P
7440-39-3	Barium	3.0	J		P
7440-41-7	Beryllium	0.34 ~~0.098~~	~~J~~	UB	P
7440-43-9	Cadmium	0.067	J		P
7440-70-2	Calcium	198000			P
7440-47-3	Chromium	2.5			P
7440-48-4	Cobalt	1.1	J		P
7440-50-8	Copper	2.5			P
7439-89-6	Iron	3690		~~E~~ J	P
7439-92-1	Lead	3.9			P
7439-95-4	Magnesium	113000			P
7439-96-5	Manganese	176		~~N~~ J	P
7440-02-0	Nickel	2.3	J		P
7440-09-7	Potassium	212	J		P
7782-49-2	Selenium	2.4	U		P
7440-22-4	Silver	0.68	U		P
7440-23-5	Sodium	133	J		P
7440-28-0	Thallium	1.7	U		P
7440-62-2	Vanadium	4.9			P
7440-66-6	Zinc	4.1	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: BROWN Clarity After: CLOUDY Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1220
Matrix: SOIL Lab Sample Id: 200-10396-6
% Solids: 99.4 Date Received: 04/18/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.099	U		CV

Color Before: BLACK Clarity Before: Texture: FINE
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-1

Sample wt/vol: 7.77 (g/mL) g Lab File ID: NFWB05.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.40 Date Analyzed: 04/24/2012

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	3.2	U
74-87-3	Chloromethane	3.2	U
75-01-4	Vinyl chloride	3.2	U
74-83-9	Bromomethane	3.2	U
75-00-3	Chloroethane	3.2	U
75-69-4	Trichlorofluoromethane	3.2	U
75-35-4	1,1-Dichloroethene	3.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.2	U
67-64-1	Acetone	6.5	U
75-15-0	Carbon disulfide	3.2	U
79-20-9	Methyl acetate	3.2	U
75-09-2	Methylene chloride	3.2 ~~0.27~~ ~~J B~~ UB	
156-60-5	trans-1,2-Dichloroethene	3.2	U
1634-04-4	Methyl tert-butyl ether	3.2	U
75-34-3	1,1-Dichloroethane	3.2	U
156-59-2	cis-1,2-Dichloroethene	3.2	U
78-93-3	2-Butanone	6.5	U
74-97-5	Bromochloromethane	3.2	U
67-66-3	Chloroform	3.2	U
71-55-6	1,1,1-Trichloroethane	3.2	U
110-82-7	Cyclohexane	3.2	U
56-23-5	Carbon tetrachloride	3.2	U
71-43-2	Benzene	3.2	U
107-06-2	1,2-Dichloroethane	3.2	U
123-91-1	1,4-Dioxane	65	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-1

Sample wt/vol: 7.77 (g/mL) g Lab File ID: NFWB05.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.40 Date Analyzed: 04/24/2012

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	3.2	U
108-87-2	Methylcyclohexane	3.2	U
78-87-5	1,2-Dichloropropane	3.2	U
75-27-4	Bromodichloromethane	3.2	U
10061-01-5	cis-1,3-Dichloropropene	3.2	U
108-10-1	4-Methyl-2-pentanone	6.5	U
108-88-3	Toluene	3.2 ~~0.052~~	~~J B~~ UB
10061-02-6	trans-1,3-Dichloropropene	3.2	U
79-00-5	1,1,2-Trichloroethane	3.2	U
127-18-4	Tetrachloroethene	3.2	U
591-78-6	2-Hexanone	6.5	U
124-48-1	Dibromochloromethane	3.2	U
106-93-4	1,2-Dibromoethane	3.2	U
108-90-7	Chlorobenzene	3.2	U
100-41-4	Ethylbenzene	3.2	U
95-47-6	o-Xylene	3.2	U
179601-23-1	m,p-Xylene	3.2	U
100-42-5	Styrene	3.2	U
75-25-2	Bromoform	3.2	U
98-82-8	Isopropylbenzene	3.2	U
79-34-5	1,1,2,2-Tetrachloroethane	3.2	U
541-73-1	1,3-Dichlorobenzene	3.2	U
106-46-7	1,4-Dichlorobenzene	3.2	U
95-50-1	1,2-Dichlorobenzene	3.2	U
96-12-8	1,2-Dibromo-3-chloropropane	3.2	U
120-82-1	1,2,4-Trichlorobenzene	3.2 ~~0.15~~	~~J B~~ UB
87-61-6	1,2,3-Trichlorobenzene	3.2 ~~0.16~~	~~J B~~ UB

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-2

Sample wt/vol: 7.97 (g/mL) g Lab File ID: NFWB06.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.40 Date Analyzed: 04/24/2012

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	3.1	U
74-87-3	Chloromethane	3.1	U
75-01-4	Vinyl chloride	3.1	U
74-83-9	Bromomethane	3.1	U
75-00-3	Chloroethane	3.1	U
75-69-4	Trichlorofluoromethane	3.1	U
75-35-4	1,1-Dichloroethene	3.1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	U
67-64-1	Acetone	6.3	U
75-15-0	Carbon disulfide	3.1	U
79-20-9	Methyl acetate	3.1	U
75-09-2	Methylene chloride	3.1 ~~0.11~~	~~J B~~ UB
156-60-5	trans-1,2-Dichloroethene	3.1	U
1634-04-4	Methyl tert-butyl ether	3.1	U
75-34-3	1,1-Dichloroethane	3.1	U
156-59-2	cis-1,2-Dichloroethene	3.1	U
78-93-3	2-Butanone	6.3	U
74-97-5	Bromochloromethane	3.1	U
67-66-3	Chloroform	3.1	U
71-55-6	1,1,1-Trichloroethane	3.1	U
110-82-7	Cyclohexane	3.1	U
56-23-5	Carbon tetrachloride	3.1	U
71-43-2	Benzene	3.1	U
107-06-2	1,2-Dichloroethane	3.1	U
123-91-1	1,4-Dioxane	63	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-2

Sample wt/vol: 7.97 (g/mL) g Lab File ID: NFWB06.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.40 Date Analyzed: 04/24/2012

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	3.1	U	
108-87-2	Methylcyclohexane	3.1	U	
78-87-5	1,2-Dichloropropane	3.1	U	
75-27-4	Bromodichloromethane	3.1	U	
10061-01-5	cis-1,3-Dichloropropene	3.1	U	
108-10-1	4-Methyl-2-pentanone	6.3	U	
108-88-3	Toluene	3.1 ~~0.067~~	~~J B~~	UB
10061-02-6	trans-1,3-Dichloropropene	3.1	U	
79-00-5	1,1,2-Trichloroethane	3.1	U	
127-18-4	Tetrachloroethene	3.1	U	
591-78-6	2-Hexanone	6.3	U	
124-48-1	Dibromochloromethane	3.1	U	
106-93-4	1,2-Dibromoethane	3.1	U	
108-90-7	Chlorobenzene	3.1	U	
100-41-4	Ethylbenzene	3.1	U	
95-47-6	o-Xylene	3.1	U	
179601-23-1	m,p-Xylene	3.1	U	
100-42-5	Styrene	3.1	U	
75-25-2	Bromoform	3.1	U	
98-82-8	Isopropylbenzene	3.1	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.1	U	
541-73-1	1,3-Dichlorobenzene	3.1	U	
106-46-7	1,4-Dichlorobenzene	3.1	U	
95-50-1	1,2-Dichlorobenzene	3.1	U	
96-12-8	1,2-Dibromo-3-chloropropane	3.1	U	
120-82-1	1,2,4-Trichlorobenzene	3.1 ~~0.11~~	~~J B~~	UB
87-61-6	1,2,3-Trichlorobenzene	3.1 ~~0.12~~	~~J B~~	UB

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-3

Sample wt/vol: 7.13 (g/mL) g Lab File ID: NFWB09.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 2.3 Date Analyzed: 04/24/2012

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	3.6	U
74-87-3	Chloromethane	3.6	U
75-01-4	Vinyl chloride	3.6	U
74-83-9	Bromomethane	3.6	U
75-00-3	Chloroethane	3.6	U
75-69-4	Trichlorofluoromethane	3.6	U
75-35-4	1,1-Dichloroethene	3.6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.6	U
67-64-1	Acetone	7.2	U
75-15-0	Carbon disulfide	3.6	U
79-20-9	Methyl acetate	3.6	U
75-09-2	Methylene chloride	3.6 ~~0.14~~ ~~J B~~ UB	
156-60-5	trans-1,2-Dichloroethene	3.6	U
1634-04-4	Methyl tert-butyl ether	3.6	U
75-34-3	1,1-Dichloroethane	3.6	U
156-59-2	cis-1,2-Dichloroethene	3.6	U
78-93-3	2-Butanone	7.2	U
74-97-5	Bromochloromethane	3.6	U
67-66-3	Chloroform	3.6	U
71-55-6	1,1,1-Trichloroethane	3.6	U
110-82-7	Cyclohexane	3.6	U
56-23-5	Carbon tetrachloride	3.6	U
71-43-2	Benzene	3.6	U
107-06-2	1,2-Dichloroethane	3.6	U
123-91-1	1,4-Dioxane	72	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-3

Sample wt/vol: 7.13 (g/mL) g Lab File ID: NFWB09.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 2.3 Date Analyzed: 04/24/2012

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	3.6	U
108-87-2	Methylcyclohexane	3.6	U
78-87-5	1,2-Dichloropropane	3.6	U
75-27-4	Bromodichloromethane	3.6	U
10061-01-5	cis-1,3-Dichloropropene	3.6	U
108-10-1	4-Methyl-2-pentanone	7.2	U
108-88-3	Toluene	3.6 ~~0.15~~ ~~J B~~	UB
10061-02-6	trans-1,3-Dichloropropene	3.6	U
79-00-5	1,1,2-Trichloroethane	3.6	U
127-18-4	Tetrachloroethene	3.6	U
591-78-6	2-Hexanone	7.2	U
124-48-1	Dibromochloromethane	3.6	U
106-93-4	1,2-Dibromoethane	3.6	U
108-90-7	Chlorobenzene	3.6	U
100-41-4	Ethylbenzene	3.6	U
95-47-6	o-Xylene	3.6	U
179601-23-1	m,p-Xylene	3.6	U
100-42-5	Styrene	3.6	U
75-25-2	Bromoform	3.6	U
98-82-8	Isopropylbenzene	3.6	U
79-34-5	1,1,2,2-Tetrachloroethane	3.6	U
541-73-1	1,3-Dichlorobenzene	3.6	U
106-46-7	1,4-Dichlorobenzene	3.6	U
95-50-1	1,2-Dichlorobenzene	3.6	U
96-12-8	1,2-Dibromo-3-chloropropane	3.6	U
120-82-1	1,2,4-Trichlorobenzene	3.6	U
87-61-6	1,2,3-Trichlorobenzene	3.6	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-4

Sample wt/vol: 6.68 (g/mL) g Lab File ID: NFWB10.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 1.1 Date Analyzed: 04/24/2012

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	3.8	U
74-87-3	Chloromethane	3.8	U
75-01-4	Vinyl chloride	3.8	U
74-83-9	Bromomethane	3.8	U
75-00-3	Chloroethane	3.8	U
75-69-4	Trichlorofluoromethane	3.8	U
75-35-4	1,1-Dichloroethene	3.8	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.8	U
67-64-1	Acetone	7.6	U
75-15-0	Carbon disulfide	3.8	U
79-20-9	Methyl acetate	3.8	U
75-09-2	Methylene chloride	3.8 ~~0.19~~	~~J B~~ UB
156-60-5	trans-1,2-Dichloroethene	3.8	U
1634-04-4	Methyl tert-butyl ether	3.8	U
75-34-3	1,1-Dichloroethane	3.8	U
156-59-2	cis-1,2-Dichloroethene	3.8	U
78-93-3	2-Butanone	7.6	U
74-97-5	Bromochloromethane	3.8	U
67-66-3	Chloroform	3.8	U
71-55-6	1,1,1-Trichloroethane	3.8	U
110-82-7	Cyclohexane	3.8	U
56-23-5	Carbon tetrachloride	3.8	U
71-43-2	Benzene	3.8	U
107-06-2	1,2-Dichloroethane	3.8	U
123-91-1	1,4-Dioxane	76	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-4

Sample wt/vol: 6.68 (g/mL) g Lab File ID: NFWB10.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 1.1 Date Analyzed: 04/24/2012

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	3.8	U
108-87-2	Methylcyclohexane	3.8	U
78-87-5	1,2-Dichloropropane	3.8	U
75-27-4	Bromodichloromethane	3.8	U
10061-01-5	cis-1,3-Dichloropropene	3.8	U
108-10-1	4-Methyl-2-pentanone	7.6	U
108-88-3	Toluene	3.8 ~~0.081~~	~~J B~~ UB
10061-02-6	trans-1,3-Dichloropropene	3.8	U
79-00-5	1,1,2-Trichloroethane	3.8	U
127-18-4	Tetrachloroethene	3.8	U
591-78-6	2-Hexanone	7.6	U
124-48-1	Dibromochloromethane	3.8	U
106-93-4	1,2-Dibromoethane	3.8	U
108-90-7	Chlorobenzene	3.8	U
100-41-4	Ethylbenzene	3.8	U
95-47-6	o-Xylene	3.8	U
179601-23-1	m,p-Xylene	3.8	U
100-42-5	Styrene	3.8	U
75-25-2	Bromoform	3.8	U
98-82-8	Isopropylbenzene	3.8	U
79-34-5	1,1,2,2-Tetrachloroethane	3.8	U
541-73-1	1,3-Dichlorobenzene	3.8	U
106-46-7	1,4-Dichlorobenzene	3.8	U
95-50-1	1,2-Dichlorobenzene	3.8	U
96-12-8	1,2-Dibromo-3-chloropropane	3.8	U
120-82-1	1,2,4-Trichlorobenzene	3.8	U
87-61-6	1,2,3-Trichlorobenzene	3.8	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-5

Sample wt/vol: 9.45 (g/mL) g Lab File ID: NFWB11.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.80 Date Analyzed: 04/24/2012

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	2.7	U
74-87-3	Chloromethane	2.7	U
75-01-4	Vinyl chloride	2.7	U
74-83-9	Bromomethane	2.7	U
75-00-3	Chloroethane	2.7	U
75-69-4	Trichlorofluoromethane	2.7	U
75-35-4	1,1-Dichloroethene	2.7	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.7	U
67-64-1	Acetone	5.3	U
75-15-0	Carbon disulfide	2.7	U
79-20-9	Methyl acetate	2.7	U
75-09-2	Methylene chloride	~~0.15~~ 2.7 ~~J B~~ UB	
156-60-5	trans-1,2-Dichloroethene	2.7	U
1634-04-4	Methyl tert-butyl ether	2.7	U
75-34-3	1,1-Dichloroethane	2.7	U
156-59-2	cis-1,2-Dichloroethene	2.7	U
78-93-3	2-Butanone	5.3	U
74-97-5	Bromochloromethane	2.7	U
67-66-3	Chloroform	2.7	U
71-55-6	1,1,1-Trichloroethane	2.7	U
110-82-7	Cyclohexane	2.7	U
56-23-5	Carbon tetrachloride	2.7	U
71-43-2	Benzene	2.7	U
107-06-2	1,2-Dichloroethane	2.7	U
123-91-1	1,4-Dioxane	53	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-5

Sample wt/vol: 9.45 (g/mL) g Lab File ID: NFWB11.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.80 Date Analyzed: 04/24/2012

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	2.7	U
108-87-2	Methylcyclohexane	2.7	U
78-87-5	1,2-Dichloropropane	2.7	U
75-27-4	Bromodichloromethane	2.7	U
10061-01-5	cis-1,3-Dichloropropene	2.7	U
108-10-1	4-Methyl-2-pentanone	5.3	U
108-88-3	Toluene	2.7 ~~0.066~~	~~J B~~ UB
10061-02-6	trans-1,3-Dichloropropene	2.7	U
79-00-5	1,1,2-Trichloroethane	2.7	U
127-18-4	Tetrachloroethene	2.7	U
591-78-6	2-Hexanone	5.3	U
124-48-1	Dibromochloromethane	2.7	U
106-93-4	1,2-Dibromoethane	2.7	U
108-90-7	Chlorobenzene	2.7	U
100-41-4	Ethylbenzene	2.7	U
95-47-6	o-Xylene	2.7	U
179601-23-1	m,p-Xylene	2.7	U
100-42-5	Styrene	2.7	U
75-25-2	Bromoform	2.7	U
98-82-8	Isopropylbenzene	2.7	U
79-34-5	1,1,2,2-Tetrachloroethane	2.7	U
541-73-1	1,3-Dichlorobenzene	2.7	U
106-46-7	1,4-Dichlorobenzene	2.7	U
95-50-1	1,2-Dichlorobenzene	2.7	U
96-12-8	1,2-Dibromo-3-chloropropane	2.7	U
120-82-1	1,2,4-Trichlorobenzene	2.7	U
87-61-6	1,2,3-Trichlorobenzene	2.7	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-6

Sample wt/vol: 7.78 (g/mL) g Lab File ID: NFWB12.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.70 Date Analyzed: 04/24/2012

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	3.2	U
74-87-3	Chloromethane	3.2	U
75-01-4	Vinyl chloride	3.2	U
74-83-9	Bromomethane	3.2	U
75-00-3	Chloroethane	3.2	U
75-69-4	Trichlorofluoromethane	3.2	U
75-35-4	1,1-Dichloroethene	3.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.2	U
67-64-1	Acetone	6.5	U
75-15-0	Carbon disulfide	3.2	U
79-20-9	Methyl acetate	3.2	U
75-09-2	Methylene chloride	3.2	U
156-60-5	trans-1,2-Dichloroethene	3.2	U
1634-04-4	Methyl tert-butyl ether	3.2	U
75-34-3	1,1-Dichloroethane	3.2	U
156-59-2	cis-1,2-Dichloroethene	3.2	U
78-93-3	2-Butanone	6.5	U
74-97-5	Bromochloromethane	3.2	U
67-66-3	Chloroform	3.2	U
71-55-6	1,1,1-Trichloroethane	3.2	U
110-82-7	Cyclohexane	3.2	U
56-23-5	Carbon tetrachloride	3.2	U
71-43-2	Benzene	3.2	U
107-06-2	1,2-Dichloroethane	3.2	U
123-91-1	1,4-Dioxane	65	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10425-6

Sample wt/vol: 7.78 (g/mL) g Lab File ID: NFWB12.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. 0.70 Date Analyzed: 04/24/2012

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	3.2	U
108-87-2	Methylcyclohexane	3.2	U
78-87-5	1,2-Dichloropropane	3.2	U
75-27-4	Bromodichloromethane	3.2	U
10061-01-5	cis-1,3-Dichloropropene	3.2	U
108-10-1	4-Methyl-2-pentanone	6.5	U
108-88-3	Toluene	~~3.2 0.071~~	~~J B~~ UB
10061-02-6	trans-1,3-Dichloropropene	3.2	U
79-00-5	1,1,2-Trichloroethane	3.2	U
127-18-4	Tetrachloroethene	3.2	U
591-78-6	2-Hexanone	6.5	U
124-48-1	Dibromochloromethane	3.2	U
106-93-4	1,2-Dibromoethane	3.2	U
108-90-7	Chlorobenzene	3.2	U
100-41-4	Ethylbenzene	3.2	U
95-47-6	o-Xylene	3.2	U
179601-23-1	m,p-Xylene	3.2	U
100-42-5	Styrene	3.2	U
75-25-2	Bromoform	3.2	U
98-82-8	Isopropylbenzene	3.2	U
79-34-5	1,1,2,2-Tetrachloroethane	3.2	U
541-73-1	1,3-Dichlorobenzene	3.2	U
106-46-7	1,4-Dichlorobenzene	3.2	U
95-50-1	1,2-Dichlorobenzene	3.2	U
96-12-8	1,2-Dibromo-3-chloropropane	3.2	U
120-82-1	1,2,4-Trichlorobenzene	3.2	U
87-61-6	1,2,3-Trichlorobenzene	3.2	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04172012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10425-7

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: NFTB05.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. Date Analyzed: 04/30/2012

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	5.0	U
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	0.66	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	0.38	J B
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

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04172012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10425-7

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: NFTB05.D

Level: (TRACE/LOW/MED) LOW Date Received: 04/21/2012

% Moisture: not dec. Date Analyzed: 04/30/2012

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	0.30	J
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	0.069	J
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	0.14	J B
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	0.15	J
100-41-4	Ethylbenzene	0.080	J
95-47-6	o-Xylene	5.0	U
179601-23-1	m,p-Xylene	0.078	J
100-42-5	Styrene	0.089	J
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	0.48	J B
87-61-6	1,2,3-Trichlorobenzene	0.48	J B

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-1

Sample wt/vol: 29.7 (g/mL) g Lab File ID: PJCGJ06.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.50 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/03/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170 ~~13~~ ~~J B~~	UB
108-95-2	Phenol	170	U
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	170	U
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	330	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	330	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-1

Sample wt/vol: 29.7 (g/mL) g Lab File ID: PJCGJ06.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.50 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/03/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	330	U
100-02-7	4-Nitrophenol	330	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	330	U
534-52-1	4,6-Dinitro-2-methylphenol	330	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	330	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	170	U
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	170	U
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-2

Sample wt/vol: 30.7 (g/mL) g Lab File ID: PJCGJ08.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/03/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170	U
108-95-2	Phenol	16	J
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	26	J
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	320	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	320	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-2

Sample wt/vol: 30.7 (g/mL) g Lab File ID: PJCGJ08.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/03/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	320	U
100-02-7	4-Nitrophenol	320	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	320	U
534-52-1	4,6-Dinitro-2-methylphenol	320	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	320	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	170	U
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	170	U
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-3

Sample wt/vol: 30.1 (g/mL) g Lab File ID: PJCGM05.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 1.7 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) Y pH: 7.9 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170 ~~16~~ ~~J B~~ UB	
108-95-2	Phenol	22	J
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	35	J
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	330	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	330	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-3

Sample wt/vol: 30.1 (g/mL) g Lab File ID: PJCGM05.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 1.7 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) Y pH: 7.9 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	330	U
100-02-7	4-Nitrophenol	330	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	330	U
534-52-1	4,6-Dinitro-2-methylphenol	330	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	330	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	8.4	J
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	23	J
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-4

Sample wt/vol: 30.8 (g/mL) g Lab File ID: PJCGM06.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 1.0 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) Y pH: 8.3 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170	U
108-95-2	Phenol	15	J
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	29	J
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	320	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	320	U

EPA SAMPLE NO.
PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-4

Sample wt/vol: 30.8 (g/mL) g Lab File ID: PJCGM06.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 1.0 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) Y pH: 8.3 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	320	U
100-02-7	4-Nitrophenol	320	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	320	U
534-52-1	4,6-Dinitro-2-methylphenol	320	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	320	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	7.9	J
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	27	J
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-5

Sample wt/vol: 29.7 (g/mL) g Lab File ID: PJCGJ13.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.40 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/03/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170	U
108-95-2	Phenol	170	U
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	23	J
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	330	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	330	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-5

Sample wt/vol: 29.7 (g/mL) g Lab File ID: PJCGJ13.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.40 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/03/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	330	U
100-02-7	4-Nitrophenol	330	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	330	U
534-52-1	4,6-Dinitro-2-methylphenol	330	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	330	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	170	U
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	170	U
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-6

Sample wt/vol: 29.9 (g/mL) g Lab File ID: PJCGM07.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.60 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) Y pH: 8.1 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
110-86-1	Pyridine	170	U
100-52-7	Benzaldehyde	170 ~~12~~ ~~J B~~ UB	
108-95-2	Phenol	14	J
111-44-4	Bis(2-chloroethyl)ether	170	U
95-57-8	2-Chlorophenol	170	U
95-48-7	2-Methylphenol	170	U
108-60-1	2,2'-Oxybis(1-chloropropane)	170	U
98-86-2	Acetophenone	28	J
106-44-5	4-Methylphenol	170	U
621-64-7	N-Nitroso-di-n-propylamine	170	U
67-72-1	Hexachloroethane	170	U
98-95-3	Nitrobenzene	170	U
78-59-1	Isophorone	170	U
88-75-5	2-Nitrophenol	170	U
105-67-9	2,4-Dimethylphenol	170	U
111-91-1	Bis(2-chloroethoxy)methane	170	U
120-83-2	2,4-Dichlorophenol	170	U
91-20-3	Naphthalene	170	U
106-47-8	4-Chloroaniline	170	U
87-68-3	Hexachlorobutadiene	170	U
105-60-2	Caprolactam	170	U
59-50-7	4-Chloro-3-methylphenol	170	U
91-57-6	2-Methylnaphthalene	170	U
77-47-4	Hexachlorocyclopentadiene	170	U
88-06-2	2,4,6-Trichlorophenol	170	U
95-95-4	2,4,5-Trichlorophenol	170	U
92-52-4	1,1'-Biphenyl	170	U
91-58-7	2-Chloronaphthalene	170	U
88-74-4	2-Nitroaniline	330	U
131-11-3	Dimethylphthalate	170	U
606-20-2	2,6-Dinitrotoluene	170	U
208-96-8	Acenaphthylene	170	U
99-09-2	3-Nitroaniline	330	U

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-6

Sample wt/vol: 29.9 (g/mL) g Lab File ID: PJCGM07.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 0.60 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 04/27/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) Y pH: 8.1 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
83-32-9	Acenaphthene	170	U
51-28-5	2,4-Dinitrophenol	330	U
100-02-7	4-Nitrophenol	330	U
132-64-9	Dibenzofuran	170	U
121-14-2	2,4-Dinitrotoluene	170	U
84-66-2	Diethylphthalate	170	U
86-73-7	Fluorene	170	U
7005-72-3	4-Chlorophenyl-phenylether	170	U
100-01-6	4-Nitroaniline	330	U
534-52-1	4,6-Dinitro-2-methylphenol	330	U
86-30-6	N-Nitrosodiphenylamin [1]	170	U
95-94-3	1,2,4,5-Tetrachlorobenzene	170	U
101-55-3	4-Bromophenyl-phenylether	170	U
118-74-1	Hexachlorobenzene	170	U
1912-24-9	Atrazine	170	U
87-86-5	Pentachlorophenol	330	U
85-01-8	Phenanthrene	170	U
120-12-7	Anthracene	170	U
86-74-8	Carbazole	170	U
84-74-2	Di-n-butylphthalate	170	U
206-44-0	Fluoranthene	170	U
129-00-0	Pyrene	170	U
85-68-7	Butylbenzylphthalate	5.5	J
91-94-1	3,3'-Dichlorobenzidine	170	U
56-55-3	Benzo(a)anthracene	170	U
218-01-9	Chrysene	170	U
117-81-7	Bis(2-ethylhexyl)phthalate	170	U
117-84-0	Di-n-octylphthalate	170	U
205-99-2	Benzo(b)fluoranthene	170	U
207-08-9	Benzo(k)fluoranthene	170	U
50-32-8	Benzo(a)pyrene	170	U
193-39-5	Indeno(1,2,3-cd)pyrene	170	U
53-70-3	Dibenzo(a,h)anthracene	170	U
191-24-2	Benzo(g,h,i)perylene	170	U
58-90-2	2,3,4,6-Tetrachlorophenol	170	U

[1] Cannot be separated from Diphenylamine

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-1

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 02MAY121113-R051.D

% Moisture: 0.50 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7 ~~0.070~~	~~J P B~~ UB
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	0.038	J ~~P~~
309-00-2	Aldrin	1.7 ~~0.023~~	~~J P~~ U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3	U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	17	U
53494-70-5	Endrin ketone	3.3	U
7421-93-4	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7 ~~0.11~~	~~J P~~ U
5103-74-2	gamma-Chlordane	1.7 ~~0.070~~	~~J P B~~ UB
8001-35-2	Toxaphene	170	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-1

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 02MAY121530-R051.D

% Moisture: 0.50 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.3 ~~0.055~~	~~J P~~ U
789-02-6	2,4'-DDT	3.3	U
53-19-0	2,4'-DDD	3.3	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-2

Sample wt/vol: 30.9 (g/mL) g Lab File ID: 02MAY121113-R061.D

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
319-84-6	alpha-BHC	1.7 ~~0.012~~	~~J P B~~	UB
319-85-7	beta-BHC	1.7 ~~0.058~~	~~J P B~~	UB
319-86-8	delta-BHC	1.7	U	
58-89-9	gamma-BHC (Lindane)	1.7	U	
76-44-8	Heptachlor	1.7 ~~0.010~~	~~J P~~	U
309-00-2	Aldrin	1.7	U	
1024-57-3	Heptachlor epoxide	1.7	U	
959-98-8	Endosulfan I	1.7	U	
60-57-1	Dieldrin	3.2	U	
72-55-9	4,4'-DDE	3.2	U	
72-20-8	Endrin	3.2	U	
33213-65-9	Endosulfan II	3.2	U	
72-54-8	4,4'-DDD	3.2	U	
1031-07-8	Endosulfan sulfate	3.2	U	
50-29-3	4,4'-DDT	3.2	U	
72-43-5	Methoxychlor	17	U	
53494-70-5	Endrin ketone	3.2	U	
7421-93-4	Endrin aldehyde	3.2	U	
5103-71-9	alpha-Chlordane	1.7 ~~0.11~~	~~J P~~	U
5103-74-2	gamma-Chlordane	1.7 ~~0.036~~	~~J P B~~	UB
8001-35-2	Toxaphene	170	U	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-2

Sample wt/vol: 30.9 (g/mL) g Lab File ID: 02MAY121530-R061.D

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.2 ~~0.059~~	~~J P~~ U
789-02-6	2,4'-DDT	3.2	U
53-19-0	2,4'-DDD	3.2	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-3

Sample wt/vol: 30.2 (g/mL) g Lab File ID: 02MAY121113-R091.D

% Moisture: 1.7 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.9 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
319-84-6	alpha-BHC	1.7 ~~0.023~~	~~J P B~~	UB
319-85-7	beta-BHC	1.7 ~~0.16~~	~~J P B~~	UB
319-86-8	delta-BHC	1.7	U	
58-89-9	gamma-BHC (Lindane)	1.7 ~~0.020~~	~~J P~~ U	
76-44-8	Heptachlor	0.049	J	
309-00-2	Aldrin	1.7	U	
1024-57-3	Heptachlor epoxide	1.7	U	
959-98-8	Endosulfan I	1.7	U	
60-57-1	Dieldrin	3.3	U	
72-55-9	4,4'-DDE	3.3	U	
72-20-8	Endrin	3.3	U	
33213-65-9	Endosulfan II	3.3	U	
72-54-8	4,4'-DDD	3.3	U	
1031-07-8	Endosulfan sulfate	0.091	J	
50-29-3	4,4'-DDT	3.3	U	
72-43-5	Methoxychlor	17 ~~0.10~~	~~J P B~~	UB
53494-70-5	Endrin ketone	3.3	U	
7421-93-4	Endrin aldehyde	3.3	U	
5103-71-9	alpha-Chlordane	1.7 ~~0.042~~	~~J P~~ U	
5103-74-2	gamma-Chlordane	1.7 ~~0.032~~	~~J P B~~	UB
8001-35-2	Toxaphene	170	U	

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-3

Sample wt/vol: 30.2 (g/mL) g Lab File ID: 02MAY121530-R071.D

% Moisture: 1.7 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.9 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.3	U
789-02-6	2,4'-DDT	3.3	U
53-19-0	2,4'-DDD	3.3	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-4

Sample wt/vol: 30.2 (g/mL) g Lab File ID: 02MAY121113-R101.D

% Moisture: 1.0 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.3 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
319-84-6	alpha-BHC	1.7 ~~0.030~~	~~J P B~~	UB
319-85-7	beta-BHC	1.7 ~~0.12~~	~~J P B~~	UB
319-86-8	delta-BHC	1.7	U	
58-89-9	gamma-BHC (Lindane)	1.7	U	
76-44-8	Heptachlor	0.048	J	
309-00-2	Aldrin	1.7	U	
1024-57-3	Heptachlor epoxide	1.7	U	
959-98-8	Endosulfan I	1.7	U	
60-57-1	Dieldrin	0.11	J	
72-55-9	4,4'-DDE	3.3	U	
72-20-8	Endrin	3.3	U	
33213-65-9	Endosulfan II	3.3	U	
72-54-8	4,4'-DDD	3.3	U	
1031-07-8	Endosulfan sulfate	3.3 ~~0.074~~	~~J P~~ U	
50-29-3	4,4'-DDT	3.3	U	
72-43-5	Methoxychlor	17 ~~0.088~~	~~J P B~~	UB
53494-70-5	Endrin ketone	3.3	U	
7421-93-4	Endrin aldehyde	3.3	U	
5103-71-9	alpha-Chlordane	1.7	U	
5103-74-2	gamma-Chlordane	1.7	U	
8001-35-2	Toxaphene	170	U	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-4

Sample wt/vol: 30.2 (g/mL) g Lab File ID: 02MAY121530-R081.D

% Moisture: 1.0 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.3 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.3	U
789-02-6	2,4'-DDT	3.3	U
53-19-0	2,4'-DDD	3.3	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-5

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 02MAY121113-R111.D

% Moisture: 0.40 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
319-84-6	alpha-BHC	1.7 ~~0.036~~	~~J P B~~ UB
319-85-7	beta-BHC	1.7 ~~0.16~~	~~J P B~~ UB
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7 ~~0.033~~	~~J P~~ U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	3.3	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	3.3	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	3.3	U
1031-07-8	Endosulfan sulfate	3.3 ~~0.042~~	~~J P~~ U
50-29-3	4,4'-DDT	3.3	U
72-43-5	Methoxychlor	1.7 ~~0.069~~	~~J P B~~ UB
53494-70-5	Endrin ketone	3.3	U
7421-93-4	Endrin aldehyde	3.3	U
5103-71-9	alpha-Chlordane	1.7 ~~0.13~~	~~J P~~ U
5103-74-2	gamma-Chlordane	1.7 ~~0.035~~	~~J P B~~ UB
8001-35-2	Toxaphene	170	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-5

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 02MAY121530-R091.D

% Moisture: 0.40 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.4 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.3	U
789-02-6	2,4'-DDT	3.3	U
53-19-0	2,4'-DDD	3.3	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-6

Sample wt/vol: 30.7 (g/mL) g Lab File ID: 02MAY121113-R121.D

% Moisture: 0.60 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
319-84-6	alpha-BHC	1.7 ~~0.027~~	~~J P B~~	UB
319-85-7	beta-BHC	1.7 ~~0.055~~	~~J B~~	UB
319-86-8	delta-BHC	1.7	U	
58-89-9	gamma-BHC (Lindane)	1.7	U	
76-44-8	Heptachlor	0.029	J~~P~~	
309-00-2	Aldrin	1.7	U	
1024-57-3	Heptachlor epoxide	1.7	U	
959-98-8	Endosulfan I	1.7	U	
60-57-1	Dieldrin	3.2	U	
72-55-9	4,4'-DDE	3.2	U	
72-20-8	Endrin	3.2	U	
33213-65-9	Endosulfan II	3.2	U	
72-54-8	4,4'-DDD	3.2	U	
1031-07-8	Endosulfan sulfate	3.2	U	
50-29-3	4,4'-DDT	3.2	U	
72-43-5	Methoxychlor	17 ~~0.068~~	~~J P B~~	UB
53494-70-5	Endrin ketone	3.2	U	
7421-93-4	Endrin aldehyde	3.2	U	
5103-71-9	alpha-Chlordane	1.7	U	
5103-74-2	gamma-Chlordane	1.7	U	
8001-35-2	Toxaphene	170	U	

EPA SAMPLE NO.
PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-6

Sample wt/vol: 30.7 (g/mL) g Lab File ID: 02MAY121530-R101.D

% Moisture: 0.60 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/26/2012

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.1 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
3424-82-6	2,4'-DDE	3.2 ~~0.056~~ ~~J P~~ U	
789-02-6	2,4'-DDT	3.2	U
53-19-0	2,4'-DDD	3.2	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-01

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-1

Sample wt/vol: 29.7 (g/mL) g Lab File ID: 01MAY121509-R041.D

% Moisture: 0.50 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/27/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.4 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	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
37324-23-5	Aroclor-1262	34	U
11100-14-4	Aroclor-1268	34	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-2

Sample wt/vol: 30.2 (g/mL) g Lab File ID: 01MAY121509-R051.D

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/27/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.4 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	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
37324-23-5	Aroclor-1262	33	U
11100-14-4	Aroclor-1268	33	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-03

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-3

Sample wt/vol: 29.8 (g/mL) g Lab File ID: 01MAY121509-R081.D

% Moisture: 1.7 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/27/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.9 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	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
37324-23-5	Aroclor-1262	34	U
11100-14-4	Aroclor-1268	34	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-4

Sample wt/vol: 29.8 (g/mL) g Lab File ID: 01MAY121509-R091.D

% Moisture: 1.0 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/27/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.3 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	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
37324-23-5	Aroclor-1262	34	U
11100-14-4	Aroclor-1268	34	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-05

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-5

Sample wt/vol: 30.0 (g/mL) g Lab File ID: 01MAY121509-R101.D

% Moisture: 0.40 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/27/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.4 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	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
37324-23-5	Aroclor-1262	33	U
11100-14-4	Aroclor-1268	33	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-06

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-6

Sample wt/vol: 29.9 (g/mL) g Lab File ID: 01MAY121509-R111.D

% Moisture: 0.60 Decanted: (Y/N) N Date Received: 04/18/2012

Extraction: (Type) SONC Date Extracted: 04/27/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/02/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1 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	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
37324-23-5	Aroclor-1262	33	U
11100-14-4	Aroclor-1268	33	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-1

Sample wt/vol: 30.0 (g/mL) g Lab File ID: HMSNS12.D

Extraction: (Type) SONC

% Moisture: 0.50 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/08/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	0.23	J
91-57-6	2-Methylnaphthalene	3.3	U
208-96-8	Acenaphthylene	3.3	U
83-32-9	Acenaphthene	3.3	U
86-73-7	Fluorene	3.3	U
118-74-1	Hexachlorobenzene	3.3	U
87-86-5	Pentachlorophenol	6.7	U
85-01-8	Phenanthrene	0.11	J
120-12-7	Anthracene	3.3	U
206-44-0	Fluoranthene	3.3	U
129-00-0	Pyrene	3.3	U
56-55-3	Benzo(a)anthracene	3.3	U
218-01-9	Chrysene	3.3	U
205-99-2	Benzo(b)fluoranthene	3.3	U
207-08-9	Benzo(k)fluoranthene	3.3	U
50-32-8	Benzo(a)pyrene	3.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	U
53-70-3	Dibenz(a,h)anthracene	3.3	U
191-24-2	Benzo(g,h,i)perylene	3.3	U

1F - FORM I SV-SIM

SEMIVOLATILE SIM ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1SOLBF-02

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-2

Sample wt/vol: 30.2 (g/mL) g Lab File ID: HMSNS13.D

Extraction: (Type) SONC

% Moisture: 0.30 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/08/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	0.25	J
91-57-6	2-Methylnaphthalene	0.11	J
208-96-8	Acenaphthylene	3.3	U
83-32-9	Acenaphthene	3.3	U
86-73-7	Fluorene	3.3	U
118-74-1	Hexachlorobenzene	3.3	U
87-86-5	Pentachlorophenol	6.7	UJ
85-01-8	Phenanthrene	0.092	J
120-12-7	Anthracene	3.3	U
206-44-0	Fluoranthene	3.3	U
129-00-0	Pyrene	3.3	U
56-55-3	Benzo(a)anthracene	3.3	U
218-01-9	Chrysene	3.3	U
205-99-2	Benzo(b)fluoranthene	3.3	U
207-08-9	Benzo(k)fluoranthene	3.3	U
50-32-8	Benzo(a)pyrene	3.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	U
53-70-3	Dibenz(a,h)anthracene	3.3	U
191-24-2	Benzo(g,h,i)perylene	3.3	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-3

Sample wt/vol: 29.9 (g/mL) g Lab File ID: HMSNS16.D

Extraction: (Type) SONC

% Moisture: 1.7 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/09/2012

GPC Cleanup: (Y/N) Y pH: 7.9 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	0.38	J
91-57-6	2-Methylnaphthalene	0.18	J
208-96-8	Acenaphthylene	3.4	U
83-32-9	Acenaphthene	3.4	U
86-73-7	Fluorene	3.4	U
118-74-1	Hexachlorobenzene	3.4	U
87-86-5	Pentachlorophenol	6.8	U
85-01-8	Phenanthrene	0.12	J
120-12-7	Anthracene	3.4	U
206-44-0	Fluoranthene	3.4	U
129-00-0	Pyrene	0.17	J
56-55-3	Benzo(a)anthracene	3.4	U
218-01-9	Chrysene	3.4	U
205-99-2	Benzo(b)fluoranthene	3.4	U
207-08-9	Benzo(k)fluoranthene	3.4	U
50-32-8	Benzo(a)pyrene	3.4	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.4	U
53-70-3	Dibenz(a,h)anthracene	3.4	U
191-24-2	Benzo(g,h,i)perylene	3.4	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-4

Sample wt/vol: 30.1 (g/mL) g Lab File ID: HMSNS17.D

Extraction: (Type) SONC

% Moisture: 1.0 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/09/2012

GPC Cleanup: (Y/N) Y pH: 8.3 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	0.33	J
91-57-6	2-Methylnaphthalene	0.16	J
208-96-8	Acenaphthylene	3.3	U
83-32-9	Acenaphthene	3.3	U
86-73-7	Fluorene	3.3	U
118-74-1	Hexachlorobenzene	3.3	U
87-86-5	Pentachlorophenol	6.7	U
85-01-8	Phenanthrene	0.13	J
120-12-7	Anthracene	3.3	U
206-44-0	Fluoranthene	3.3	U
129-00-0	Pyrene	0.10	J
56-55-3	Benzo(a)anthracene	3.3	U
218-01-9	Chrysene	3.3	U
205-99-2	Benzo(b)fluoranthene	3.3	U
207-08-9	Benzo(k)fluoranthene	3.3	U
50-32-8	Benzo(a)pyrene	3.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	U
53-70-3	Dibenz(a,h)anthracene	3.3	U
191-24-2	Benzo(g,h,i)perylene	3.3	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-5

Sample wt/vol: 30.1 (g/mL) g Lab File ID: HMSNS18.D

Extraction: (Type) SONC

% Moisture: 0.40 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/09/2012

GPC Cleanup: (Y/N) Y pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	0.32	J
91-57-6	2-Methylnaphthalene	0.17	J
208-96-8	Acenaphthylene	3.3	U
83-32-9	Acenaphthene	3.3	U
86-73-7	Fluorene	3.3	U
118-74-1	Hexachlorobenzene	3.3	U
87-86-5	Pentachlorophenol	6.7	U
85-01-8	Phenanthrene	0.16	J
120-12-7	Anthracene	3.3	U
206-44-0	Fluoranthene	0.086	J
129-00-0	Pyrene	0.14	J
56-55-3	Benzo(a)anthracene	3.3	U
218-01-9	Chrysene	3.3	U
205-99-2	Benzo(b)fluoranthene	3.3	U
207-08-9	Benzo(k)fluoranthene	3.3	U
50-32-8	Benzo(a)pyrene	3.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	U
53-70-3	Dibenz(a,h)anthracene	3.3	U
191-24-2	Benzo(g,h,i)perylene	3.3	U

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1220

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-10396-6

Sample wt/vol: 29.9 (g/mL) g Lab File ID: HMSNS19.D

Extraction: (Type) SONC

% Moisture: 0.60 Decanted: (Y/N) N Date Received: 04/18/2012

Concentrated Extract Volume: 500 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 05/09/2012

GPC Cleanup: (Y/N) Y pH: 8.1 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
91-20-3	Naphthalene	0.35	J
91-57-6	2-Methylnaphthalene	0.18	J
208-96-8	Acenaphthylene	3.3	U
83-32-9	Acenaphthene	3.3	U
86-73-7	Fluorene	3.3	U
118-74-1	Hexachlorobenzene	3.3	U
87-86-5	Pentachlorophenol	6.8	U
85-01-8	Phenanthrene	0.19	J
120-12-7	Anthracene	3.3	U
206-44-0	Fluoranthene	0.11	J
129-00-0	Pyrene	0.20	J
56-55-3	Benzo(a)anthracene	3.3	U
218-01-9	Chrysene	3.3	U
205-99-2	Benzo(b)fluoranthene	3.3	U
207-08-9	Benzo(k)fluoranthene	3.3	U
50-32-8	Benzo(a)pyrene	3.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	U
53-70-3	Dibenz(a,h)anthracene	3.3	U
191-24-2	Benzo(g,h,i)perylene	0.089	J

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-01 Lab Sample ID: 200-10396-1

Matrix: Solid Lab File ID: 26ap121624-r091.d

Analysis Method: 8151A Date Collected: 04/17/2012 13:00

Extraction Method: 8151A Date Extracted: 04/19/2012 10:11

Sample wt/vol: 49.76(g) Date Analyzed: 04/27/2012 06:43

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 0.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	38	U	38	5.7
94-82-6	2,4-DB	19	U	19	7.4
93-76-5	2,4,5-T	9.6	U	9.6	1.5
93-72-1	Silvex (2,4,5-TP)	3.8	U	3.8	0.45

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	63		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-02 Lab Sample ID: 200-10396-2

Matrix: Solid Lab File ID: 26ap121624-r101.d

Analysis Method: 8151A Date Collected: 04/17/2012 13:10

Extraction Method: 8151A Date Extracted: 04/19/2012 10:11

Sample wt/vol: 50.13(g) Date Analyzed: 04/27/2012 07:19

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 0.3 GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	38	U	38	5.6
94-82-6	2,4-DB	19	U	19	7.3
93-76-5	2,4,5-T	9.5	U	9.5	1.5
93-72-1	Silvex (2,4,5-TP)	3.8	U	3.8	0.45

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	78		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-03 Lab Sample ID: 200-10396-3

Matrix: Solid Lab File ID: 26ap121624-r131.d

Analysis Method: 8151A Date Collected: 04/17/2012 13:20

Extraction Method: 8151A Date Extracted: 04/19/2012 10:11

Sample wt/vol: 49.65(g) Date Analyzed: 04/27/2012 09:08

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 1.7 GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	39	U	39	5.7
94-82-6	2,4-DB	19	U	19	7.5
93-76-5	2,4,5-T	9.7	U	9.7	1.5
93-72-1	Silvex (2,4,5-TP)	3.9	U	3.9	0.46

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	61		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-04 | Lab Sample ID: 200-10396-4

Matrix: Solid | Lab File ID: 26ap121624-r141.d

Analysis Method: 8151A | Date Collected: 04/17/2012 13:30

Extraction Method: 8151A | Date Extracted: 04/19/2012 10:11

Sample wt/vol: 50.53(g) | Date Analyzed: 04/27/2012 09:45

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 1.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	19	U	19	7.3
93-72-1	Silvex (2,4,5-TP)	3.8	U	3.8	0.45

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	95		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-04 | Lab Sample ID: 200-10396-4

Matrix: Solid | Lab File ID: 26ap121624-r141.d

Analysis Method: 8151A | Date Collected: 04/17/2012 13:30

Extraction Method: 8151A | Date Extracted: 04/19/2012 10:11

Sample wt/vol: 50.53(g) | Date Analyzed: 04/27/2012 09:45

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: 1.0 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	22	J	38	5.6
93-76-5	2,4,5-T	13		9.5	1.5

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	96		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-05 Lab Sample ID: 200-10396-5

Matrix: Solid Lab File ID: 26ap121624-r151.d

Analysis Method: 8151A Date Collected: 04/17/2012 13:40

Extraction Method: 8151A Date Extracted: 04/19/2012 10:11

Sample wt/vol: 50.17(g) Date Analyzed: 04/27/2012 10:22

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 0.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	38	U	38	5.6
94-82-6	2,4-DB	19	U	19	7.3
93-76-5	2,4,5-T	9.5	U	9.5	1.5
93-72-1	Silvex (2,4,5-TP)	3.8	U	3.8	0.45

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	99		25-195

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG No.: PRR1220

Client Sample ID: PRR1SOLBF-06 Lab Sample ID: 200-10396-6

Matrix: Solid Lab File ID: 26ap121624-r161.d

Analysis Method: 8151A Date Collected: 04/17/2012 13:50

Extraction Method: 8151A Date Extracted: 04/19/2012 10:11

Sample wt/vol: 49.97(g) Date Analyzed: 04/27/2012 10:59

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: 0.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	38	U	38	5.6
94-82-6	2,4-DB	19	U	19	7.3
93-76-5	2,4,5-T	2.3	J	9.6	1.5
93-72-1	Silvex (2,4,5-TP)	3.8	U	3.8	0.45

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	83		25-195

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLBF-01 Lab Sample ID: 200-10396-1

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG ID.: PRR1220

Matrix: Solid Date Sampled: 04/17/2012 13:00

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.05			SU		~~H~~	1	9045C

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLBF-02 Lab Sample ID: 200-10396-2

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG ID.: PRR1220

Matrix: Solid Date Sampled: 04/17/2012 13:10

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.21			SU		HF	1	9045C

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLBF-03 Lab Sample ID: 200-10396-3

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG ID.: PRR1220

Matrix: Solid Date Sampled: 04/17/2012 13:20

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.28			SU		~~H~~	1	9045C

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLBF-04 Lab Sample ID: 200-10396-4

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG ID.: PRR1220

Matrix: Solid Date Sampled: 04/17/2012 13:30

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.24			SU		~~HP~~	1	9045C

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLBF-05 Lab Sample ID: 200-10396-5

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG ID.: PRR1220

Matrix: Solid Date Sampled: 04/17/2012 13:40

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.28			SU		~~HF~~	1	9045C

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1SOLBF-06 Lab Sample ID: 200-10396-6

Lab Name: TestAmerica Burlington Job No.: 200-10396-2

SDG ID.: PRR1220

Matrix: Solid Date Sampled: 04/17/2012 13:50

Reporting Basis: WET Date Received: 04/18/2012 10:20

CAS No.	Analyte	Result			Units	C	Q	DIL	Method
	pH	9.35			SU		HP	1	9045C

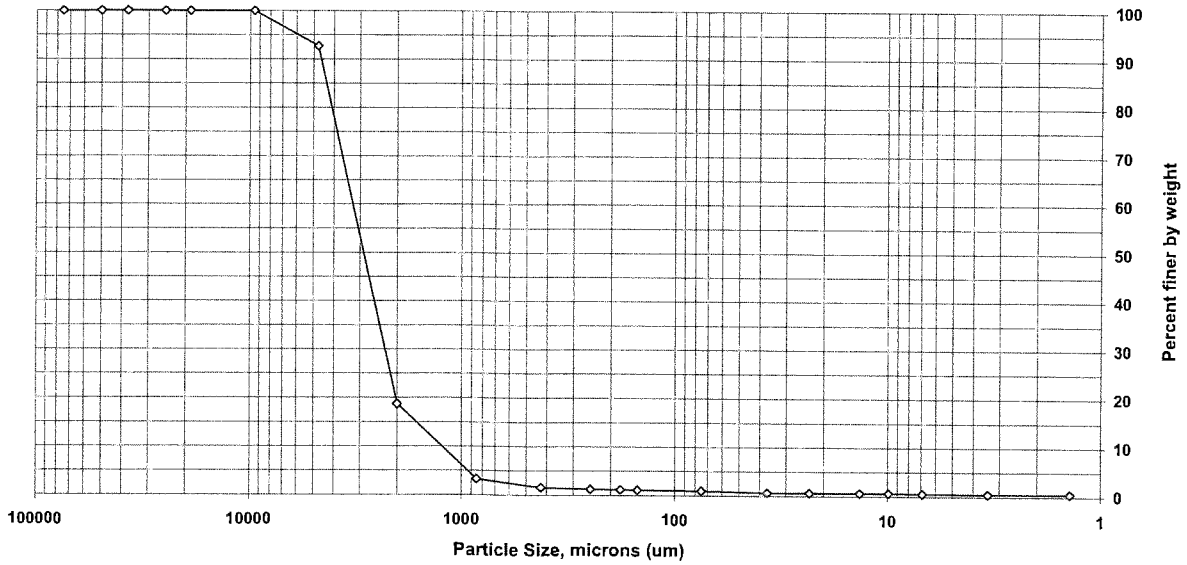
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLBF-01	**Percent Solids:**	99.3%	**Date Received:**	4/18/2012
Lab ID:	200-10396-F-1	**Specific Gravity:**	2.650	**Start Date:**	4/20/2012
				End Date:	4/27/2012

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	92.7	7.3
#10	2000	18.7	74.0
#20	850	3.3	15.4
#40	425	1.6	1.8
#60	250	1.3	0.3
#80	180	1.2	0.1
#100	150	1.1	0.0
#200	75	1.0	0.1
Hyd1	36.8	0.6	0.4
Hyd2	23.3	0.6	0.0
Hyd3	13.5	0.6	0.0
Hyd4	9.9	0.6	0.0
Hyd5	6.9	0.6	0.0
Hyd6	3.4	0.5	0.1
Hyd7	1.4	0.5	0.0

Soil Classification	Percent of sample
Gravel	7.3
Sand	91.7
Coarse Sand	74.0
Medium Sand	17.1
Fine Sand	0.6
Silt	0.4
Clay	0.6

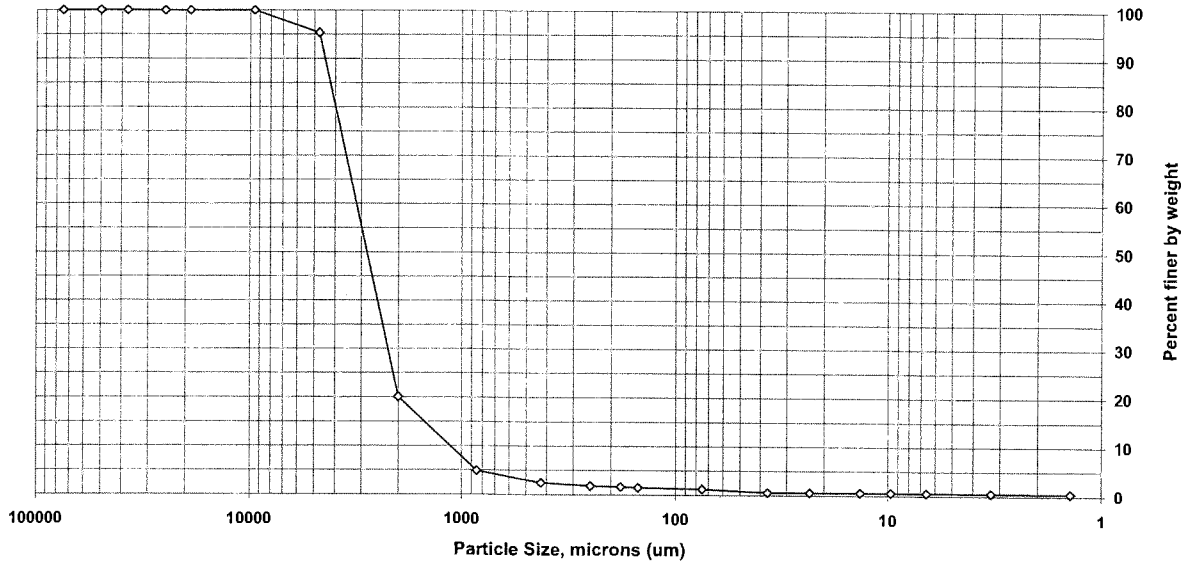
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLBF-02	**Percent Solids:**	99.4%	**Date Received:**	4/18/2012
Lab ID:	200-10396-F-2	**Specific Gravity:**	2.650	**Start Date:**	4/20/2012
				End Date:	4/27/2012

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	95.4	4.6
#10	2000	20.1	75.3
#20	850	4.9	15.3
#40	425	2.4	2.4
#60	250	1.8	0.6
#80	180	1.6	0.2
#100	150	1.5	0.1
#200	75	1.3	0.3
Hyd1	37	0.6	0.7
Hyd2	23.4	0.6	0.0
Hyd3	13.5	0.6	0.0
Hyd4	9.7	0.6	0.0
Hyd5	6.6	0.5	0.0
Hyd6	3.3	0.5	0.0
Hyd7	1.4	0.5	0.1

Soil Classification	Percent of sample
Gravel	4.6
Sand	94.1
Coarse Sand	75.3
Medium Sand	17.7
Fine Sand	1.2
Silt	0.7
Clay	0.5

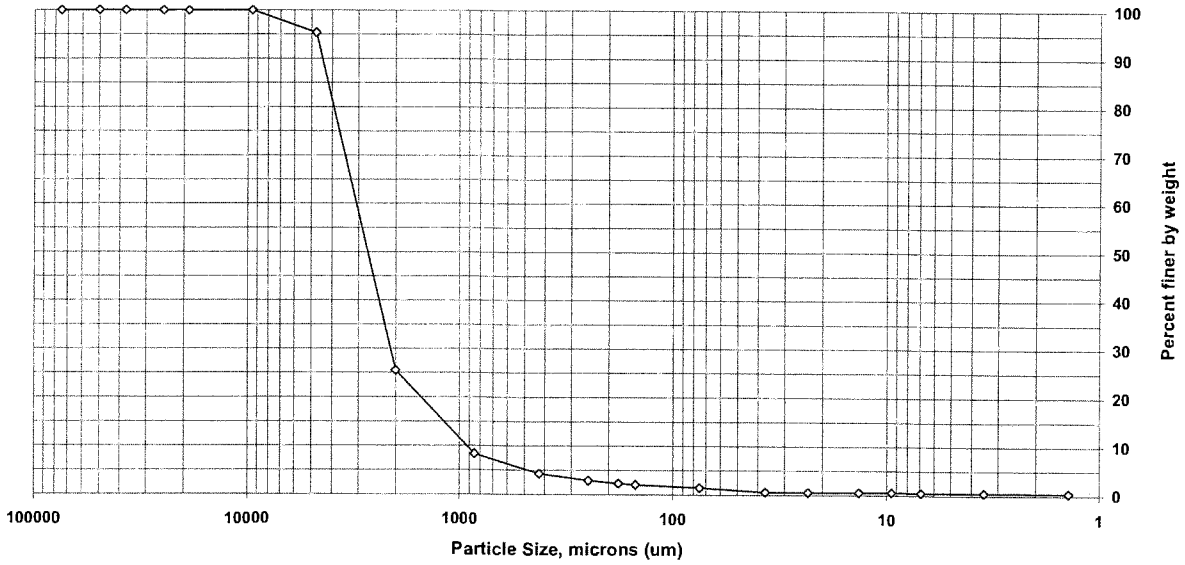
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLBF-03	**Percent Solids:**	99.1%	**Date Received:**	4/18/2012
Lab ID:	200-10396-F-3	**Specific Gravity:**	2.650	**Start Date:**	4/20/2012
				End Date:	4/27/2012

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	95.4	4.6
#10	2000	25.5	69.9
#20	850	8.4	17.1
#40	425	4.3	4.1
#60	250	2.9	1.5
#80	180	2.3	0.5
#100	150	2.1	0.3
#200	75	1.4	0.6
Hyd1	37	0.6	0.9
Hyd2	23.4	0.6	0.0
Hyd3	13.5	0.6	0.0
Hyd4	9.5	0.5	0.0
Hyd5	6.9	0.5	0.0
Hyd6	3.5	0.5	0.0
Hyd7	1.4	0.5	0.0

Soil Classification	Percent of sample
Gravel	4.6
Sand	94.0
Coarse Sand	69.9
Medium Sand	21.2
Fine Sand	2.9
Silt	0.9
Clay	0.5

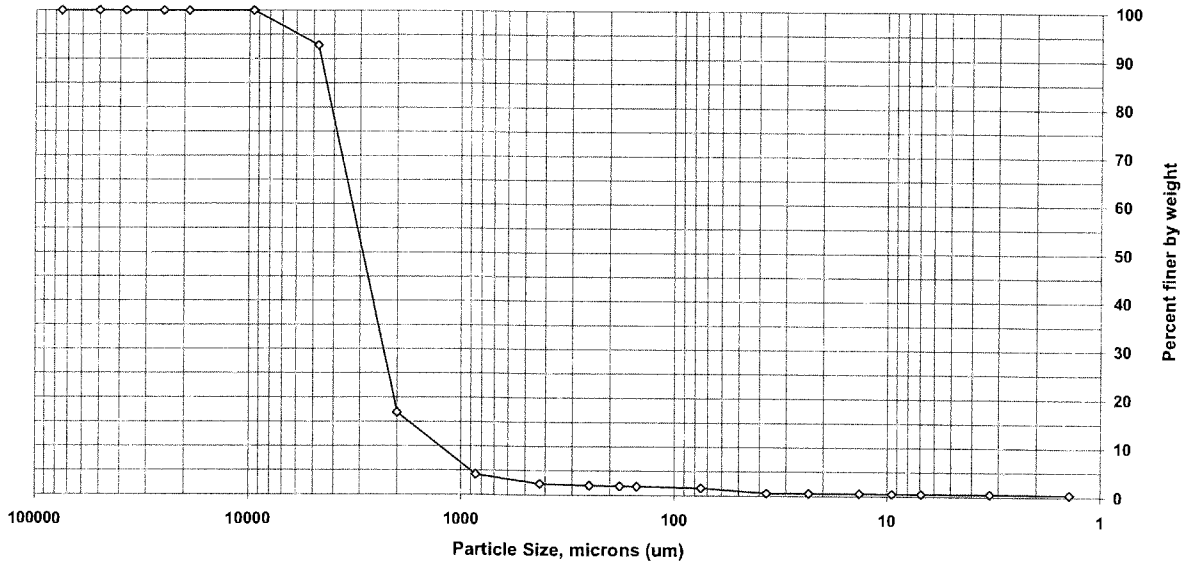
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLBF-04	**Percent Solids:**	99.6%	**Date Received:**	4/18/2012
Lab ID:	200-10396-F-4	**Specific Gravity:**	2.650	**Start Date:**	4/20/2012
				End Date:	4/27/2012

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	92.8	7.2
#10	2000	16.9	75.9
#20	850	4.2	12.7
#40	425	2.3	1.9
#60	250	2.0	0.3
#80	180	1.9	0.1
#100	150	1.8	0.1
#200	75	1.6	0.3
Hyd1	37	0.6	1.0
Hyd2	23.4	0.6	0.0
Hyd3	13.5	0.6	0.0
Hyd4	9.5	0.5	0.0
Hyd5	6.9	0.5	0.0
Hyd6	3.3	0.5	0.0
Hyd7	1.4	0.5	0.0

Soil Classification	Percent of sample
Gravel	7.2
Sand	91.3
Coarse Sand	75.9
Medium Sand	14.6
Fine Sand	0.7
Silt	1.0
Clay	0.5

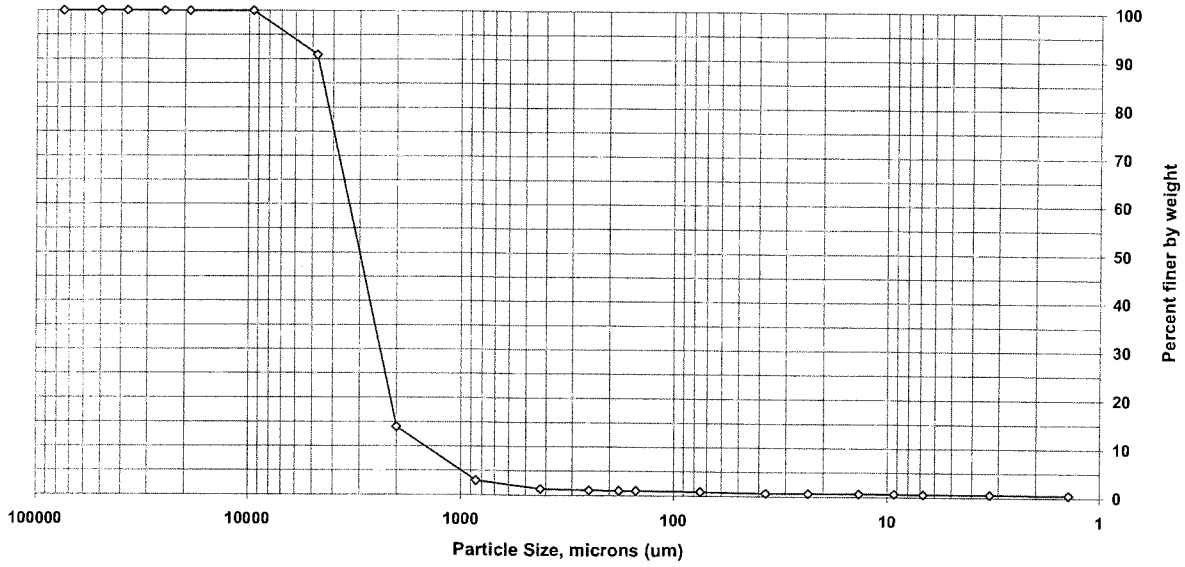
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLBF-05	**Percent Solids:**	99.5%	**Date Received:**	4/18/2012
Lab ID:	200-10396-F-5	**Specific Gravity:**	2.650	**Start Date:**	4/20/2012
				End Date:	4/27/2012

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	90.9	9.1
#10	2000	14.0	76.9
#20	850	2.9	11.1
#40	425	1.3	1.6
#60	250	1.1	0.3
#80	180	1.0	0.1
#100	150	1.0	0.0
#200	75	0.9	0.1
Hyd1	37.2	0.6	0.3
Hyd2	23.5	0.6	0.0
Hyd3	13.6	0.6	0.0
Hyd4	9.3	0.6	0.0
Hyd5	6.8	0.6	0.0
Hyd6	3.3	0.5	0.0
Hyd7	1.4	0.5	0.0

Soil Classification	Percent of sample
Gravel	9.1
Sand	90.0
Coarse Sand	76.9
Medium Sand	12.7
Fine Sand	0.4
Silt	0.3
Clay	0.6

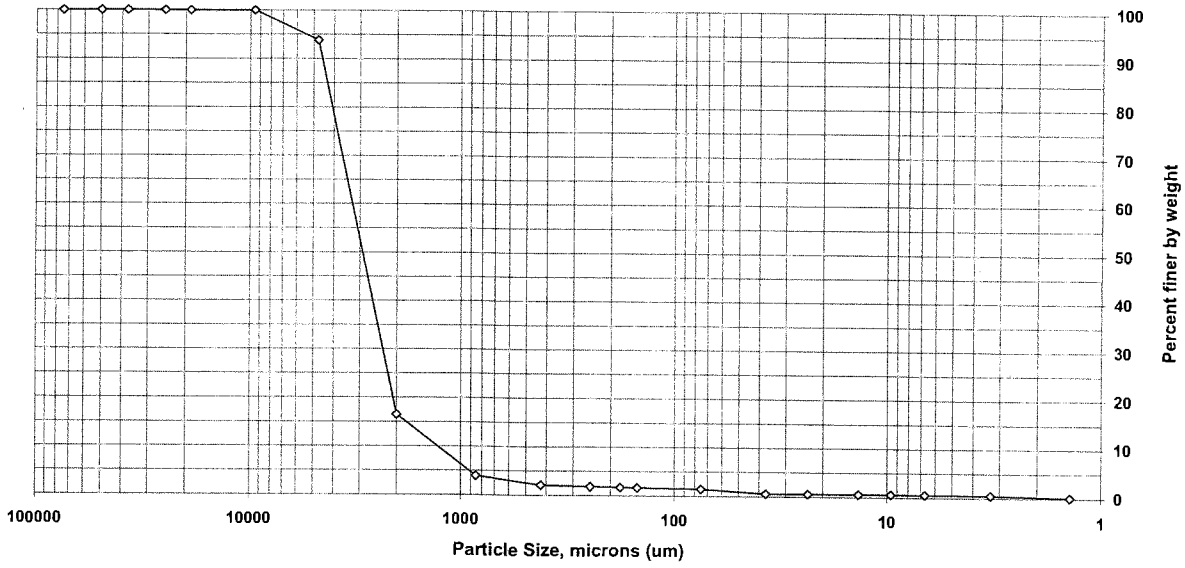
Particle Size of Soils by ASTM D422

Sample ID:	PRR1SOLBF-06	**Percent Solids:**	99.5%	**Date Received:**	4/18/2012
Lab ID:	200-10396-F-6	**Specific Gravity:**	2.650	**Start Date:**	4/20/2012
				End Date:	4/27/2012

Shape (> #10): angular

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	93.8	6.2
#10	2000	16.5	77.3
#20	850	3.9	12.6
#40	425	2.1	1.8
#60	250	1.8	0.3
#80	180	1.7	0.1
#100	150	1.7	0.0
#200	75	1.4	0.2
Hyd1	37.2	0.6	0.8
Hyd2	23.5	0.6	0.0
Hyd3	13.6	0.6	0.0
Hyd4	9.6	0.6	0.0
Hyd5	6.7	0.5	0.0
Hyd6	3.3	0.5	0.0
Hyd7	1.4	0.1	0.4

Soil Classification	Percent of sample
Gravel	6.2
Sand	92.4
Coarse Sand	77.3
Medium Sand	14.4
Fine Sand	0.7
Silt	0.9
Clay	0.5

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1220	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLBF-01	4/17/2012	13:00	soil	Composite	6	x	x	x	x	x	x	x	x										
PRR1SOLBF-02	4/17/2012	13:10	soil	Composite	18	x	x	x	x	x	x	x	x										MS and MSD
PRR1SOLBF-03	4/17/2012	13:20	soil	Composite	6	x	x	x	x	x	x	x	x										
PRR1SOLBF-04	4/17/2012	13:30	soil	Composite	6	x	x	x	x	x	x	x	x										
PRR1SOLBF-05	4/17/2012	13:40	soil	Composite	6	x	x	x	x	x	x	x	x										
PRR1SOLBF-06	4/17/2012	13:50	soil	Composite	6	x	x	x	x	x	x	x	x										
TB04172012	4/17/2012		water	-	3	x																	

	Requested Analyses
1	VOCs
2	SVOCs
3	Aroclor PCBs
4	Pesticides
5	Metals
6	Herbicides
7	pH
8	Grain Size
9	
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP Worksheet 15-1 for Backfill Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT
Shipping Tracking #
Specify Turnaround Requirements: standard TAT

☒ Cooler packed with ice
☒ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp: 5.0°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	04/17/12	1830	FASVC 04/18/12 0850			

Page 6 of 224

05/04/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1220 (33725)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17232R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1220 (33725) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1SOLBF-01	33725-001	Soil	4/17/2012					X	
PRR1SOLBF-02	33725-002	Soil	4/17/2012					X	
PRR1SOLBF-03	33725-003	Soil	4/17/2012					X	
PRR1SOLBF-04	33725-004	Soil	4/17/2012					X	
PRR1SOLBF-05	33725-005	Soil	4/17/2012					X	
PRR1SOLBF-06	33725-006	Soil	4/17/2012					X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) or EDLs during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. The MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

6. SECOND COLUMN CONFIRMATION

The compound 2,3,7,8-TCDF was not detected in any samples from within this SDG.

7. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

11. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 19, 2012

PEER REVIEW: Dennis Capria

DATE: October 11, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1220 - Dioxins/Furans

ANALYTE	Units	PRR1SOLBF-01	LQ	VQ	PRR1SOLBF-02	LQ	VQ	PRR1SOLBF-03	LQ	VQ
2,3,7,8-TCDD	pg/g	0.119	U	U	0.105	U	U	0.115	U	U
1,2,3,7,8-PeCDD	pg/g	0.111	U	U	0.105	U	U	0.122	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.117	U	U	0.153	U	U	0.114	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.133	U	U	0.175	U	U	0.132	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.142	U	U	0.17	U	U	0.138	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.211	U	U	0.167	U	U	0.182	U	U
OCDD	pg/g	0.196	U	U	0.247	U	U	0.475	U	U
Total TCDD	pg/g	0.119	U	U	0.105	U	U	0.116	U	U
Total PeCDD	pg/g	0.111	U	U	0.105	U	U	0.122	U	U
Total HxCDD	pg/g	0.142	U	U	0.175	U	U	0.138	U	U
Total HpCDD	pg/g	0.211	U	U	0.167	U	U	0.182	U	U
2,3,7,8-TCDF	pg/g	0.144	U	U	0.142	U	U	0.147	U	U
1,2,3,7,8-PeCDF	pg/g	0.0923	U	U	0.0761	U	U	0.0773	U	U
2,3,4,7,8-PeCDF	pg/g	0.0866	U	U	0.0736	U	U	0.0796	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.0545	U	U	0.0579	U	U	0.0474	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.0496	U	U	0.0562	U	U	0.0477	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.0772	U	U	0.0941	U	U	0.0677	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.0606	U	U	0.0676	U	U	0.052	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.0648	U	U	0.0627	U	U	0.0734	U	U
1,2,3,4,7,8,9-HpCDF	pg/g	0.0915	U	U	0.0861	U	U	0.0996	U	U
OCDF	pg/g	0.2	U	U	0.18	U	U	0.198	U	U
Total TCDF	pg/g	0.144	U	U	0.142	U	U	0.147	U	U
Total PeCDF	pg/g	0.0923	U	U	0.0761	U	U	0.0796	U	U
Total HxCDF	pg/g	0.0772	U	U	0.0941	U	U	0.0677	U	U
Total HpCDF	pg/g	0.0915	U	U	0.0861	U	U	0.0996	U	U
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.17			0.165			0.171		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1220 - Dioxins/Furans

ANALYTE	Units	PRR1SOLBF-04	LQ	VQ	PRR1SOLBF-05	LQ	VQ	PRR1SOLBF-06	LQ	VQ
2,3,7,8-TCDD	pg/g	0.103	U	U	0.167	U	U	0.148	U	U
1,2,3,7,8-PeCDD	pg/g	0.159	U	U	0.129	U	U	0.121	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.136	U	U	0.125	U	U	0.115	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.159	U	U	0.143	U	U	0.128	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.17	U	U	0.151	U	U	0.134	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.16	U	U	0.23	U	U	0.192	U	U
OCDD	pg/g	0.177	U	U	0.214	U	U	0.208	U	U
Total TCDD	pg/g	0.148	U	U	0.167	U	U	0.148	U	U
Total PeCDD	pg/g	0.121	U	U	0.129	U	U	0.121	U	U
Total HxCDD	pg/g	0.134	U	U	0.151	U	U	0.134	U	U
Total HpCDD	pg/g	0.192	U	U	0.23	U	U	0.192	U	U
2,3,7,8-TCDF	pg/g	0.157	U	U	0.136	U	U	0.134	U	U
1,2,3,7,8-PeCDF	pg/g	0.0784	U	U	0.0745	U	U	0.0764	U	U
2,3,4,7,8-PeCDF	pg/g	0.0749	U	U	0.0758	U	U	0.0753	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.0521	U	U	0.0497	U	U	0.0537	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.0532	U	U	0.0485	U	U	0.0509	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.0765	U	U	0.071	U	U	0.0744	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.0566	U	U	0.0531	U	U	0.0584	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.075	U	U	0.0647	U	U	0.0603	U	U
1,2,3,4,7,8,9-HpCDF	pg/g	0.108	U	U	0.0997	U	U	0.0819	U	U
OCDF	pg/g	0.183	U	U	0.193	U	U	0.187	U	U
Total TCDF	pg/g	0.134	U	U	0.136	U	U	0.134	U	U
Total PeCDF	pg/g	0.0764	U	U	0.0758	U	U	0.0764	U	U
Total HxCDF	pg/g	0.0744	U	U	0.071	U	U	0.0744	U	U
Total HpCDF	pg/g	0.0819	U	U	0.0997	U	U	0.0819	U	U
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.188			0.201			0.186		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: **PRR1SOLBF-01** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33725-001	Date Received:	18-Apr-12
Project:	PRR1220	Sample Size:	10.0 g	QC Batch No.:	4397	Date Extracted:	24-Apr-12
Date Collected:	17-Apr-12	%Solids:	99.3	Date Analyzed DB-5:	30-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1300						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND	0.119		
1,2,3,7,8-PeCDD	ND	0.111		
1,2,3,4,7,8-HxCDD	ND	0.117		
1,2,3,6,7,8-HxCDD	ND	0.133		
1,2,3,7,8,9-HxCDD	ND	0.142		
1,2,3,4,6,7,8-HpCDD	ND	0.211		
OCDD	ND	0.196		
2,3,7,8-TCDF	ND	0.144		
1,2,3,7,8-PeCDF	ND	0.0923		
2,3,4,7,8-PeCDF	ND	0.0866		
1,2,3,4,7,8-HxCDF	ND	0.0545		
1,2,3,6,7,8-HxCDF	ND	0.0496		
2,3,4,6,7,8-HxCDF	ND	0.0606		
1,2,3,7,8,9-HxCDF	ND	0.0772		
1,2,3,4,6,7,8-HpCDF	ND	0.0648		
1,2,3,4,7,8,9-HpCDF	ND	0.0915		
OCDF	ND	0.200		

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	99.6	25 - 164	
	13C-1,2,3,7,8-PeCDD	97.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	81.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	76.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	87.5	23 - 140	
	13C-OCDD	75.8	17 - 157	
	13C-2,3,7,8-TCDF	97.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	101	24 - 185	
	13C-2,3,4,7,8-PeCDF	101	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	91.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	89.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	86.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	91.8	26 - 138	
	13C-OCDF	86.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	103	35 - 197	

Totals			
Total TCDD	ND	0.119	
Total PeCDD	ND	0.111	
Total HxCDD	ND	0.142	
Total HpCDD	ND	0.211	
Total TCDF	ND	0.144	
Total PeCDF	ND	0.0923	
Total HxCDF	ND	0.0772	
Total HpCDF	ND	0.0915	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 02-May-2012 09:42

Sample ID: **PRR1SOLBF-02** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33725-002	Date Received:	18-Apr-12
Project:	PRR1220	Sample Size:	10.1 g	QC Batch No.:	4397	Date Extracted:	24-Apr-12
Date Collected:	17-Apr-12	%Solids:	99.5	Date Analyzed DB-5:	30-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1310						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND	0.105		
1,2,3,7,8-PeCDD	ND	0.105		
1,2,3,4,7,8-HxCDD	ND	0.153		
1,2,3,6,7,8-HxCDD	ND	0.175		
1,2,3,7,8,9-HxCDD	ND	0.170		
1,2,3,4,6,7,8-HpCDD	ND	0.167		
OCDD	ND	0.247		
2,3,7,8-TCDF	ND	0.142		
1,2,3,7,8-PeCDF	ND	0.0761		
2,3,4,7,8-PeCDF	ND	0.0736		
1,2,3,4,7,8-HxCDF	ND	0.0579		
1,2,3,6,7,8-HxCDF	ND	0.0562		
2,3,4,6,7,8-HxCDF	ND	0.0676		
1,2,3,7,8,9-HxCDF	ND	0.0941		
1,2,3,4,6,7,8-HpCDF	ND	0.0627		
1,2,3,4,7,8,9-HpCDF	ND	0.0861		
OCDF	ND	0.180		

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	98.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	97.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	81.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	76.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	80.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	93.1	23 - 140	
	13C-OCDD	82.1	17 - 157	
	13C-2,3,7,8-TCDF	94.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	102	24 - 185	
	13C-2,3,4,7,8-PeCDF	101	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	89.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	90.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	90.5	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	85.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	93.2	26 - 138	
	13C-OCDF	91.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	102	35 - 197	

Totals			
Total TCDD	ND	0.105	
Total PeCDD	ND	0.105	
Total HxCDD	ND	0.175	
Total HpCDD	ND	0.167	
Total TCDF	ND	0.142	
Total PeCDF	ND	0.0761	
Total HxCDF	ND	0.0941	
Total HpCDF	ND	0.0861	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 02-May-2012 09:42

Sample ID: **PRR1SOLBF-03** **EPA Method 1613**

Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33725-003	Date Received:	18-Apr-12
Project:	PRR1220	Sample Size:	10.1 g	QC Batch No.:	4397	Date Extracted:	24-Apr-12
Date Collected:	17-Apr-12	%Solids:	99.6	Date Analyzed DB-5:	30-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1320						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND	0.115		
1,2,3,7,8-PeCDD	ND	0.122		
1,2,3,4,7,8-HxCDD	ND	0.114		
1,2,3,6,7,8-HxCDD	ND	0.132		
1,2,3,7,8,9-HxCDD	ND	0.138		
1,2,3,4,6,7,8-HpCDD	ND	0.182		
OCDD	ND	0.475		
2,3,7,8-TCDF	ND	0.147		
1,2,3,7,8-PeCDF	ND	0.0773		
2,3,4,7,8-PeCDF	ND	0.0796		
1,2,3,4,7,8-HxCDF	ND	0.0474		
1,2,3,6,7,8-HxCDF	ND	0.0477		
2,3,4,6,7,8-HxCDF	ND	0.0520		
1,2,3,7,8,9-HxCDF	ND	0.0677		
1,2,3,4,6,7,8-HpCDF	ND	0.0734		
1,2,3,4,7,8,9-HpCDF	ND	0.0996		
OCDF	ND	0.198		

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	98.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	81.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	75.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	78.3	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	86.9	23 - 140	
	13C-OCDD	74.0	17 - 157	
	13C-2,3,7,8-TCDF	94.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	100	24 - 185	
	13C-2,3,4,7,8-PeCDF	97.9	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	93.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	89.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	92.4	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	83.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	90.5	26 - 138	
	13C-OCDF	85.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	99.7	35 - 197	

Totals		
Total TCDD	ND	0.116
Total PeCDD	ND	0.122
Total HxCDD	ND	0.138
Total HpCDD	ND	0.182
Total TCDF	ND	0.147
Total PeCDF	ND	0.0796
Total HxCDF	ND	0.0677
Total HpCDF	ND	0.0996

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 02-May-2012 09:42

Sample ID: **PRR1SOLBF-04** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33725-004	Date Received:	18-Apr-12
Project:	PRR1220	Sample Size:	10.2 g	QC Batch No.:	4397	Date Extracted:	24-Apr-12
Date Collected:	17-Apr-12	%Solids:	99.4	Date Analyzed DB-5:	30-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1330						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND	0.103		
1,2,3,7,8-PeCDD	ND	0.159		
1,2,3,4,7,8-HxCDD	ND	0.136		
1,2,3,6,7,8-HxCDD	ND	0.159		
1,2,3,7,8,9-HxCDD	ND	0.170		
1,2,3,4,6,7,8-HpCDD	ND	0.160		
OCDD	ND	0.177		
2,3,7,8-TCDF	ND	0.157		
1,2,3,7,8-PeCDF	ND	0.0784		
2,3,4,7,8-PeCDF	ND	0.0749		
1,2,3,4,7,8-HxCDF	ND	0.0521		
1,2,3,6,7,8-HxCDF	ND	0.0532		
2,3,4,6,7,8-HxCDF	ND	0.0566		
1,2,3,7,8,9-HxCDF	ND	0.0765		
1,2,3,4,6,7,8-HpCDF	ND	0.0750		
1,2,3,4,7,8,9-HpCDF	ND	0.108		
OCDF	ND	0.183		

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	98.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	98.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	80.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	76.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	78.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	91.8	23 - 140	
	13C-OCDD	81.5	17 - 157	
	13C-2,3,7,8-TCDF	96.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	103	24 - 185	
	13C-2,3,4,7,8-PeCDF	103	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	92.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	90.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	90.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	91.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	89.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	90.7	26 - 138	
	13C-OCDF	91.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	103	35 - 197	

Totals			
Total TCDD	ND	0.148	
Total PeCDD	ND	0.121	
Total HxCDD	ND	0.134	
Total HpCDD	ND	0.192	
Total TCDF	ND	0.134	
Total PeCDF	ND	0.0764	
Total HxCDF	ND	0.0744	
Total HpCDF	ND	0.0819	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 02-May-2012 09:42

Sample ID: **PRR1SOLBF-05** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33725-005	Date Received:	18-Apr-12
Project:	PRR1220	Sample Size:	10.0 g	QC Batch No.:	4397	Date Extracted:	24-Apr-12
Date Collected:	17-Apr-12	%Solids:	99.5	Date Analyzed DB-5:	30-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1340						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND	0.167		
1,2,3,7,8-PeCDD	ND	0.129		
1,2,3,4,7,8-HxCDD	ND	0.125		
1,2,3,6,7,8-HxCDD	ND	0.143		
1,2,3,7,8,9-HxCDD	ND	0.151		
1,2,3,4,6,7,8-HpCDD	ND	0.230		
OCDD	ND	0.214		
2,3,7,8-TCDF	ND	0.136		
1,2,3,7,8-PeCDF	ND	0.0745		
2,3,4,7,8-PeCDF	ND	0.0758		
1,2,3,4,7,8-HxCDF	ND	0.0497		
1,2,3,6,7,8-HxCDF	ND	0.0485		
2,3,4,6,7,8-HxCDF	ND	0.0531		
1,2,3,7,8,9-HxCDF	ND	0.0710		
1,2,3,4,6,7,8-HpCDF	ND	0.0647		
1,2,3,4,7,8,9-HpCDF	ND	0.0997		
OCDF	ND	0.193		

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	101	25 - 164	
	13C-1,2,3,7,8-PeCDD	96.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	86.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	78.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	81.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	89.5	23 - 140	
	13C-OCDD	83.0	17 - 157	
	13C-2,3,7,8-TCDF	97.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	103	24 - 185	
	13C-2,3,4,7,8-PeCDF	103	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	95.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	93.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	95.3	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	94.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	90.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	91.5	26 - 138	
	13C-OCDF	93.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Totals			
Total TCDD	ND	0.167	
Total PeCDD	ND	0.129	
Total HxCDD	ND	0.151	
Total HpCDD	ND	0.230	
Total TCDF	ND	0.136	
Total PeCDF	ND	0.0758	
Total HxCDF	ND	0.0710	
Total HpCDF	ND	0.0997	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 02-May-2012 09:42

Sample ID: **PRR1SOLBF-06** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Soil	Lab Sample:	33725-006	Date Received:	18-Apr-12
Project:	PRR1220	Sample Size:	10.0 g	QC Batch No.:	4397	Date Extracted:	24-Apr-12
Date Collected:	17-Apr-12	%Solids:	99.6	Date Analyzed DB-5:	30-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1350						

Analyte	Conc. (pg/g)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	ND	0.148		
1,2,3,7,8-PeCDD	ND	0.121		
1,2,3,4,7,8-HxCDD	ND	0.115		
1,2,3,6,7,8-HxCDD	ND	0.128		
1,2,3,7,8,9-HxCDD	ND	0.134		
1,2,3,4,6,7,8-HpCDD	ND	0.192		
OCDD	ND	0.208		
2,3,7,8-TCDF	ND	0.134		
1,2,3,7,8-PeCDF	ND	0.0764		
2,3,4,7,8-PeCDF	ND	0.0753		
1,2,3,4,7,8-HxCDF	ND	0.0537		
1,2,3,6,7,8-HxCDF	ND	0.0509		
2,3,4,6,7,8-HxCDF	ND	0.0584		
1,2,3,7,8,9-HxCDF	ND	0.0744		
1,2,3,4,6,7,8-HpCDF	ND	0.0603		
1,2,3,4,7,8,9-HpCDF	ND	0.0819		
OCDF	ND	0.187		

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	98.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	98.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	77.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	81.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	89.5	23 - 140	
	13C-OCDD	83.4	17 - 157	
	13C-2,3,7,8-TCDF	94.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	103	24 - 185	
	13C-2,3,4,7,8-PeCDF	102	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	92.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	91.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	91.9	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	95.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	89.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	92.6	26 - 138	
	13C-OCDF	91.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	102	35 - 197	

Totals			
Total TCDD	ND	0.148	
Total PeCDD	ND	0.121	
Total HxCDD	ND	0.134	
Total HpCDD	ND	0.192	
Total TCDF	ND	0.134	
Total PeCDF	ND	0.0764	
Total HxCDF	ND	0.0744	
Total HpCDF	ND	0.0819	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **0**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

The results are reported in dry weight. The sample size is reported in wet weight.

Analyst: ANP

Approved By: Calvin Tanaka 02-May-2012 09:42

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33725 1.3°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1220	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLBF-01	4/17/2012	13:00	soil	Composite	1	X																	MS and MSD
PRR1SOLBF-02	4/17/2012	13:10	soil	Composite	3	X																	
PRR1SOLBF-03	4/17/2012	13:20	soil	Composite	1	X																	
PRR1SOLBF-04	4/17/2012	13:30	soil	Composite	1	X																	
PRR1SOLBF-05	4/17/2012	13:40	soil	Composite	1	X																	
PRR1SOLBF-06	4/17/2012	13:50	soil	Composite	1	X																	

Requested Analyses	
1	Dioxins
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:
Refer to RAWP QAPP Worksheet 15-1 for Backfill Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA
Shipping Tracking #
Specify Turnaround Requirements: standard TAT

☐ Cooler packed with ice
☐ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kevin Gandhi	04/17/12	1830				4/18/12 0841
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1222 (200-10406-1, 200-10406-2 and 200-10406-3)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17240R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1222 (200-10406-1, 200-10406-2 and 200-10406-3) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-27	200-10406-1	Water	4/18/2012		X	X	X	X	X
PRR1WATCMI-27	200-10406-2	Water	4/18/2012		X	X	X		
TB04182012	200-10406-3	Water	4/18/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

One surrogate exhibited elevated recoveries associated with sample PRR1WATCMI-27. Therefore, positive results for the affected compounds indicate potential high bias.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

Compounds were detected in the associated QA blanks below the PQL; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Recovery
PRR1WATCMI-27	2,4-Dichlorophenol-d3	>UL

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	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.

Qualifier	Description
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

Compounds were detected in the associated trip blank; however, the associated sample results were non-detect. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of alpha-BHC and gamma-Chlordane. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

Two sample locations exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

One surrogate exhibited elevated recoveries in one sample. Therefore, positive results for the affected compounds indicate potential high bias.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for alpha-BHC and gamma-Chlordane. These compounds were detected in sample PRR1WATCME-27 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Column 1 Recovery	Column 2 Recovery
PRR1WATCMI-27	Tetrachloro-m-xylene	>UL	>UL
	Decachlorobiphenyl	AC	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 column are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 150%	Nondetect	No action
	Detect	J
< 30% but > 10%	Nondetect	UJ
	Detect	J
< 10%	Nondetect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Nondetect	No Action
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-27	2,4'-DDT	58.0%
	2,4'-DDT	29.7%
	beta-BHC	145.8%
	Heptachlor	523.8%
	Aldrin	140.1%
	Heptachlor epoxide	999.9%
	4,4'-DDT	32.3%
	alpha-Chlordane	999.9%
PRR1WATCMI-27	2,4'-DDT	90.2%
	delta-DHC	179.0%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R

Control Limit (%D)	Qualification
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

Compounds were detected in the associated QA blanks below the PQL; however, the associated sample results were greater than the BAL. 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. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

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

Sample Locations	Surrogate	Column 1 Recovery	Column 2 Recovery
PRR1WATCMI-27	2,4-DCPA	D	D

D – Dilution

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 column are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 150%	Nondetect	No action
	Detect	J
< 30% but > 10%	Nondetect	UJ
	Detect	J
< 10%	Nondetect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Nondetect	No Action
	Detect	

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain re-extraction and re-analysis of the samples due to QC failures associated with dinoseb. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-27	2,4-DB	40.2%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Lead. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Lead. This analyte was detected in sample PRR1WATCME-27 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL (or at the detected sample concentration if above the PQL) and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location within this SDG.

6. SERIAL DILUTION

Sample PRR1WATCME-27 was selected for the serial dilution analysis. The percent difference (%D) between the sample and the five-fold dilution values obtained met method measurement performance criteria for all analytes.

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during TOC or TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

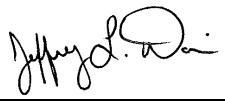
9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: September 17, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - PCBs

ANALYTE	Units	PRR1WATCME-27	LQ	VQ
Aroclor-1016	ug/L	0.95	U	U
Aroclor-1221	ug/L	0.95	U	U
Aroclor-1232	ug/L	0.95	U	U
Aroclor-1242	ug/L	0.95	U	U
Aroclor-1248	ug/L	0.95	U	U
Aroclor-1254	ug/L	0.95	U	U
Aroclor-1260	ug/L	0.95	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - Pesticides

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
2,4'-DDD	ug/L	0.032	P	J	4.5		J
2,4'-DDE	ug/L	0.014			2.2		J
2,4'-DDT	ug/L	0.0095	J P	U	0.63	P	JN
4,4'-DDD	ug/L	0.048	B		NA		
4,4'-DDE	ug/L	0.027			NA		
4,4'-DDT	ug/L	0.013	P B	J	NA		
Aldrin	ug/L	0.0048	J P	U	NA		
Alpha-BHC	ug/L	0.0048	J P B	UB	NA		
Alpha-Chlordane	ug/L	0.0048	J P	U	NA		
Beta-BHC	ug/L	0.0048	J P	U	NA		
Delta-BHC	ug/L	0.0048	U	U	0.048	J P	U
Dieldrin	ug/L	0.0095	U	U	NA		
Endosulfan I	ug/L	0.0048	U	U	NA		
Endosulfan II	ug/L	0.0095	U	U	NA		
Endosulfan Sulfate	ug/L	0.0095	U	U	NA		
Endrin	ug/L	0.0095	U	U	NA		
Endrin Aldehyde	ug/L	0.0095	U	U	NA		
Gamma-BHC (Lindane)	ug/L	0.00061	J P	J	NA		
Gamma-Chlordane	ug/L	0.0048	J P B	UB	NA		
Heptachlor	ug/L	0.0048	J P	U	NA		
Heptachlor Epoxide	ug/L	0.0048	J P	U	NA		
Toxaphene	ug/L	0.48	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - Herbicides

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
2,4,5-T	ug/L	1.7	B		2500	B	
2,4-D	ug/L	6.5			NA		
2,4-DB	ug/L	0.95	J p	J	NA		
Dinoseb	ug/L	0.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - VOCs

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	20		
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	1	U	U	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	10	U	U	150	U	U
Acrolein	ug/L	20	U	U	NA		
Acrylonitrile	ug/L	20	U	U	NA		
Benzene	ug/L	0.18	J	J	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	U	U	NA		
Chlorobenzene	ug/L	0.28	J	J	NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	1	U	U	NA		
Chloromethane	ug/L	1	U	U	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	0.32	J	J	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	0.052	J	J	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - VOCs

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - SVOCs

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U	NA		
2,4,5-Trichlorophenol	ug/L	0.17	J	J	650		J
2,4,6-Trichlorophenol	ug/L	0.68	J	J	NA		
2,4-Dichlorophenol	ug/L	4.8	U	U	NA		
2,4-Dimethylphenol	ug/L	4.8	U	U	NA		
2,4-Dinitrophenol	ug/L	9.5	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.8	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.8	U	U	NA		
2-Chlorophenol	ug/L	0.4	J	J	NA		
2-Nitrophenol	ug/L	4.8	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.8	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.5	U	U	100	U	U
4-Nitrophenol	ug/L	9.5	U	U	NA		
Anthracene	ug/L	4.8	U	U	NA		
Benzidine	ug/L	9.5	U	U	NA		
Benzo(a)anthracene	ug/L	4.8	U	U	NA		
Benzo(a)pyrene	ug/L	4.8	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.8	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.8	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.8	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	0.64	J	J	NA		
Butylbenzylphthalate	ug/L	4.8	U	U	NA		
Chrysene	ug/L	4.8	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.8	U	U	NA		
Diethylphthalate	ug/L	0.38	J	J	NA		
Dimethylphthalate	ug/L	4.8	U	U	NA		
Di-n-Butylphthalate	ug/L	4.8	U	U	NA		
Fluoranthene	ug/L	4.8	U	U	NA		
Fluorene	ug/L	4.8	U	U	NA		
Hexachlorobenzene	ug/L	4.8	U	U	NA		
Hexachlorobutadiene	ug/L	4.8	U	U	NA		
Hexachlorocyclopentadiene	ug/L	4.8	U	U	NA		
Hexachloroethane	ug/L	4.8	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - SVOCs

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U	NA		
Isophorone	ug/L	4.8	U	U	NA		
Naphthalene	ug/L	0.05	J	J	NA		
Nitrobenzene	ug/L	4.8	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.5	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.8	U	U	NA		
Pentachlorophenol	ug/L	9.5	U	U	NA		
Phenanthrene	ug/L	0.089	J	J	NA		
Phenol	ug/L	4.8	U	U	NA		
Pyrene	ug/L	4.8	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - Inorganics

ANALYTE	Units	PRR1WATCME-27	LQ	VQ
Antimony	ug/L	8.2	E	
Arsenic	ug/L	5.6		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	1.8	J	J
Copper	ug/L	9.7		
Cyanide	ug/L	10	U	U
Lead	ug/L	1.4		UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	19.6	E	
Selenium	ug/L	11.4		
Silver	ug/L	0.19	J	J
Zinc	ug/L	21.5		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1222 - Miscellaneous

ANALYTE	Units	PRR1WATCME-27	LQ	VQ
Total Organic Carbon	mg/L	4.2		
Total Suspended Solids	mg/L	5.9		

SAMPLE ANALYSIS DATA SHEETS AND COCs

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJYRJ05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/19/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/19/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/23/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.5	U
108-95-2	Phenol	4.8	U
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	0.40	J
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	4.8	U
91-20-3	Naphthalene	0.050	J
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	0.68	J
95-95-4	2,4,5-Trichlorophenol	0.17	J
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.5	U
100-02-7	4-Nitrophenol	9.5	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	0.38	J
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.5	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.5	U
85-01-8	Phenanthrene	0.089	J
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8	U
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.5	U
129-00-0	Pyrene	4.8	U

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJYRJ05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/19/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/19/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/23/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8	U
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	0.64	J
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-2

Sample wt/vol: 1000 (g/mL) mL Lab File ID: RJYRJ07.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/19/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/19/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/23/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	650	J
534-52-1	4,6-Dinitro-2-methylphenol	100	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/19/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	0.32	J
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	0.18	J
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	0.052	J
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/19/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	0.28	J
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/19/2012

% Moisture: not dec. _____ Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 29.3

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	150	U
87-61-6	1,2,3-Trichlorobenzene	20	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04182012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/19/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04182012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/19/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 24AP121839-R051.D

% Moisture: Decanted: (Y/N) Date Received: 04/19/2012

Extraction: (Type) SEPF Date Extracted: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q	
319-84-6	alpha-BHC	0.0048	~~0.00043~~	~~J P B~~	uB
319-85-7	beta-BHC	0.0048	~~0.0024~~	~~J P~~ U	
319-86-8	delta-BHC		0.0048	U	
58-89-9	gamma-BHC (Lindane)		0.00061	J ~~P~~	
76-44-8	Heptachlor	0.0048	~~0.00048~~	~~J P~~ U	
309-00-2	Aldrin	0.0048	~~0.00049~~	~~J P~~ U	
1024-57-3	Heptachlor epoxide	0.0048	~~0.00052~~	~~J P~~ U	
959-98-8	Endosulfan I		0.0048	U	
60-57-1	Dieldrin		0.0095	U	
72-55-9	4,4'-DDE		0.027		
72-20-8	Endrin		0.0095	U	
33213-65-9	Endosulfan II		0.0095	U	
72-54-8	4,4'-DDD		0.048	~~P~~	
1031-07-8	Endosulfan sulfate		0.0095	U	
50-29-3	4,4'-DDT		0.013	~~P P~~ J	
7421-93-4	Endrin aldehyde		0.0095	U	
5103-71-9	alpha-Chlordane	0.0048	~~0.00077~~	~~J P~~ U	
5103-74-2	gamma-Chlordane	0.0048	~~0.0019~~	~~J P B~~	uB
8001-35-2	Toxaphene		0.48	U	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 1060 (g/mL) mL Lab File ID: 23AP122135-R031.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 04/19/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 04/19/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.014	
789-02-6	2,4'-DDT	0.0095 ~~0.0060~~	~~J P~~ U
53-19-0	2,4'-DDD	0.032	~~P~~ J

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23AP122135-R071.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 04/19/2012

Extraction: (Type) SEPF Date Extracted: 04/19/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	2.2	J
53-19-0	2,4'-DDD	4.5	J
789-02-6	2,4'-DDT	0.63	~~P~~ JN

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23AP121641-R011.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 04/19/2012

Extraction: (Type) SEPF Date Extracted: 04/19/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/23/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.048 ~~0.034~~	~~J P~~ U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1222

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10406-1

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23AP122013-R051.D

% Moisture: Decanted: (Y/N) Date Received: 04/19/2012

Extraction: (Type) SEPF Date Extracted: 04/19/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/23/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.95	U
11104-28-2	Aroclor-1221	0.95	U
11141-16-5	Aroclor-1232	0.95	U
53469-21-9	Aroclor-1242	0.95	U
12672-29-6	Aroclor-1248	0.95	U
11097-69-1	Aroclor-1254	0.95	U
11096-82-5	Aroclor-1260	0.95	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10406-2

SDG No.: PRR1222

Client Sample ID: PRR1WATCME-27 Lab Sample ID: 200-10406-1

Matrix: Water Lab File ID: 23ap121716-r031.d

Analysis Method: 8151A Date Collected: 04/18/2012 11:30

Extraction Method: 8151A Date Extracted: 04/19/2012 13:31

Sample wt/vol: 1050(mL) Date Analyzed: 04/24/2012 01:15

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37402 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	6.5		1.8	0.62
94-82-6	2,4-DB	0.95	J ~~P~~	1.6	0.45
93-76-5	2,4,5-T	1.7	~~B~~	0.45	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	90		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10406-2

SDG No.: PRR1222

Client Sample ID: PRR1WATCME-27 Lab Sample ID: 200-10406-1

Matrix: Water Lab File ID: 23ap121716-r031.d

Analysis Method: 8151A Date Collected: 04/18/2012 11:30

Extraction Method: 8151A Date Extracted: 04/19/2012 13:31

Sample wt/vol: 1050(mL) Date Analyzed: 04/24/2012 01:15

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37402 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
88-85-7	Dinoseb	0.90	U	0.90	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	90		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10406-2

SDG No.: PRR1222

Client Sample ID: PRR1WATCMI-27 Lab Sample ID: 200-10406-2

Matrix: Water Lab File ID: 23ap121716-r041.d

Analysis Method: 8151A Date Collected: 04/18/2012 11:20

Extraction Method: 8151A Date Extracted: 04/19/2012 13:31

Sample wt/vol: 1040(mL) Date Analyzed: 04/24/2012 01:50

Con. Extract Vol.: 10000(uL) Dilution Factor: 600

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37402 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	2500	B	270	75

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1222
Matrix: WATER Lab Sample Id: 200-10406-1
% Solids: Date Received: 04/19/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	8.2		~~E~~	MS
7440-38-2	Arsenic	5.6			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	1.8	J		MS
7440-50-8	Copper	9.7			MS
7439-92-1	Lead	1.4	UB		MS
7440-02-0	Nickel	19.6		~~E~~	MS
7782-49-2	Selenium	11.4			MS
7440-22-4	Silver	0.19	J		MS
7440-66-6	Zinc	21.5			MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1222
Matrix: WATER Lab Sample Id: 200-10406-1
% Solids: Date Received: 04/19/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-27

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1222
Matrix: WATER Lab Sample Id: 200-10406-1
% Solids: Date Received: 04/19/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-27 Lab Sample ID: 200-10406-1

Lab Name: TestAmerica Burlington Job No.: 200-10406-2

SDG ID.: PRR1222

Matrix: Water Date Sampled: 04/18/2012 11:30

Reporting Basis: WET Date Received: 04/19/2012 10:15

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	4.2	1.0	0.14	mg/L			1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-27 Lab Sample ID: 200-10406-1

Lab Name: TestAmerica Burlington Job No.: 200-10406-3

SDG ID.: PRR1222

Matrix: Water Date Sampled: 04/18/2012 11:30

Reporting Basis: WET Date Received: 04/19/2012 10:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.9	0.52		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1222	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-27	4/18/2012	11:30	water	Grab	17	X	X	X	X	X	X	X	X	X									
PRR1WATCMI-27	4/18/2012	11:20	water	Grab	9		X	X		X			X										
TB04182012	4/18/2012		water		3		X																

Page 5 of 108

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS sample 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
TJ Pohl	4/18/12	1230	TABU 4/19/12 1015			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

04/28/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1222 (33726)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17241R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1222 (33726) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1WATCME-27	33726-001	Water	4/18/2012				X		X
PRR1WATCMI-27	33726-002	Water	4/18/2012				X		X

1. PCDD/PCDF by EPA Method 1613.
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in the sample PRR1WATCMI-27 and confirmation analysis was performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-27	1,2,3,4,6,7,8-HpCDF	25300 E	--	25300 EJ
	1,2,3,4,7,8,9-HpCDF	40100 E	--	40100 EJ

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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. 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. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCMI-27	PCB-1	618000 E	--	618000 EJ

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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory added the qualifier "I" which is defined by the laboratory as "Chemical Interference." These samples results were qualified as estimated (J).

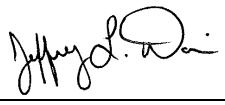
The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: September 17, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - PCB Congeners

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
PCB-1	pg/L	137			618000	E	EJ
PCB-2	pg/L	82.9			283000		
PCB-3	pg/L	82.9			109000		
PCB-4/10	pg/L	80.7			75100		
PCB-5/8	pg/L	244			175000		
PCB-6	pg/L	68.2			46500		
PCB-7/9	pg/L	170			132000		
PCB-11	pg/L	48.3			14600		
PCB-12/13	pg/L	291			253000		
PCB-14	pg/L	125			77500		
PCB-15	pg/L	56			23800		
PCB-16/32	pg/L	66.5			13200		
PCB-17	pg/L	43.7			9070		
PCB-18	pg/L	125			26200		
PCB-19	pg/L	9.42			2140		
PCB-20/21/33	pg/L	165			28300		
PCB-22	pg/L	79			12700		
PCB-23	pg/L	30.9			7100		
PCB-24/27	pg/L	67.4			25800		
PCB-25	pg/L	17.1			2350		
PCB-26	pg/L	36			5840		
PCB-28	pg/L	146			26700		
PCB-29	pg/L	18.7			4120		
PCB-30	pg/L	4.9	U	U	1520		
PCB-31	pg/L	198			26700		
PCB-34	pg/L	22			4350		
PCB-35	pg/L	33.7			7070		
PCB-36	pg/L	12.7			2270		
PCB-37	pg/L	149			28500		
PCB-38	pg/L	4.9	U	U	861		
PCB-39	pg/L	29.2			5830		
PCB-40	pg/L	26.5			2450		
PCB-41/64/71/72	pg/L	136			13000		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - PCB Congeners

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
PCB-42/59	pg/L	49.9			4340		
PCB-43/49	pg/L	135			11600		
PCB-44	pg/L	161			14300		
PCB-45	pg/L	25.1			2690		
PCB-46	pg/L	11.4			1230		
PCB-47	pg/L	47.5			4280		
PCB-48/75	pg/L	37.3			3470		
PCB-50	pg/L	4.9	U	U	81.9	J	J
PCB-51	pg/L	10.9			940		
PCB-52/69	pg/L	179			15200		
PCB-53	pg/L	27.9			2560		
PCB-54	pg/L	4.9	U	U	76.1	J	J
PCB-55	pg/L	4.9	U	U	278		
PCB-56/60	pg/L	115			9830		
PCB-57	pg/L	4.9	U	U	165		
PCB-58	pg/L	4.9	U	U	124		
PCB-61/70	pg/L	196			16000		
PCB-62	pg/L	4.9	U	U	79.6	J	J
PCB-63	pg/L	11			1010		
PCB-65	pg/L	4.9	U	U	50.9	J	J
PCB-67	pg/L	7.94			592		
PCB-68	pg/L	4.9	U	U	138		
PCB-73	pg/L	4.9	U	U	99.1	U	U
PCB-74	pg/L	100			10700		
PCB-76/66	pg/L	143			13100		
PCB-77	pg/L	25.2	B		2230	B	
PCB-78	pg/L	4.9	U	U	99.1	U	U
PCB-79	pg/L	8.95			819		
PCB-80	pg/L	4.9	U	U	103		
PCB-81	pg/L	4.45	U,*	U	141	B	
PCB-82	pg/L	32.8			1670		
PCB-83	pg/L	4.9	U	U	40.4	J	J
PCB-84/92	pg/L	85.8			4770		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - PCB Congeners

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
PCB-85/116	pg/L	50.2			1810		
PCB-86	pg/L	5.32			307		
PCB-87/117/125	pg/L	79.7			4100		
PCB-88/91	pg/L	35.9			1950		
PCB-89	pg/L	5.11			250		
PCB-90/101	pg/L	223			11300		
PCB-93	pg/L	4.9	U	U	99.1	U	U
PCB-94	pg/L	4.9	U	U	156		
PCB-95/98/102	pg/L	162			9450		
PCB-96	pg/L	4.9	U	U	172		
PCB-97	pg/L	70.3			3460		
PCB-99	pg/L	114			6410		
PCB-100	pg/L	4.9	U	U	142		
PCB-103	pg/L	4.9	U	U	154		
PCB-104	pg/L	4.9	U	U	99.1	U	U
PCB-105	pg/L	70.9			3810		
PCB-106/118	pg/L	206	B		11900	B	
PCB-107/109	pg/L	16.5			871		
PCB-108/112	pg/L	11.1			588		
PCB-110	pg/L	240			12300		
PCB-111/115	pg/L	6.14			439		
PCB-113	pg/L	4.9	U	U	99.1	U	U
PCB-114	pg/L	15.5			1760		
PCB-119	pg/L	6.5			362		
PCB-120	pg/L	4.9	U	U	101		
PCB-121	pg/L	4.9	U	U	99.1	U	U
PCB-122	pg/L	4.9	U	U	155		
PCB-123	pg/L	5.72			379		
PCB-124	pg/L	9.96			477		
PCB-126	pg/L	2.46	J	J	176	U,I	UJ
PCB-127	pg/L	4.9	U	U	99.1	U	U
PCB-128/162	pg/L	49.5			1420		
PCB-129	pg/L	17.2			562		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - PCB Congeners

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
PCB-130	pg/L	20.3			565		
PCB-131	pg/L	4.9	U	U	53.9	J	J
PCB-132/161	pg/L	78.7			2440		
PCB-133/142	pg/L	9.5			305		
PCB-134/143	pg/L	16			533		
PCB-135	pg/L	27			948		
PCB-136	pg/L	37.5			1100		
PCB-137	pg/L	18.6			808		
PCB-138/163/164	pg/L	287			8770		
PCB-139/149	pg/L	170			5490		
PCB-140	pg/L	4.9	U	U	66	J	J
PCB-141	pg/L	65.7			2640		
PCB-144	pg/L	12			394		
PCB-145	pg/L	4.9	U	U	99.1	U	U
PCB-146/165	pg/L	39.3			1140		
PCB-147	pg/L	5.68			193		
PCB-148	pg/L	4.9	U	U	49.1	J	J
PCB-150	pg/L	4.9	U	U	53.4	J	J
PCB-151	pg/L	50.1			1660		
PCB-152	pg/L	4.9	U	U	99.1	U	U
PCB-153	pg/L	267			8130		
PCB-154	pg/L	7.03			209		
PCB-155	pg/L	5.73			164		
PCB-156	pg/L	54.7	B		3110	B	
PCB-157	pg/L	9.48			360		
PCB-158/160	pg/L	36.6			1300		
PCB-159	pg/L	4.9	U	U	99.1	U	U
PCB-166	pg/L	4.9	U	U	290		
PCB-167	pg/L	17.3			829		
PCB-168	pg/L	4.9	U	U	34.9	J	J
PCB-169	pg/L	1.28	U,*	U	47.7	J,B	J
PCB-170	pg/L	97.9			2510		
PCB-171	pg/L	26.6			589		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - PCB Congeners

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
PCB-172	pg/L	16.5			463		
PCB-173	pg/L	4.9	U	U	124		
PCB-174	pg/L	107			2300		
PCB-175	pg/L	6.73			165		
PCB-176	pg/L	15.1			355		
PCB-177	pg/L	56.4			1200		
PCB-178	pg/L	21.7			491		
PCB-179	pg/L	52.8			1140		
PCB-180	pg/L	239			6150		
PCB-181	pg/L	4.9	U	U	46.8	J	J
PCB-182/187	pg/L	142			3050		
PCB-183	pg/L	64.6			1480		
PCB-184	pg/L	4.9	U	U	99.1	U	U
PCB-185	pg/L	16.3			522		
PCB-186	pg/L	4.9	U	U	99.1	U	U
PCB-188	pg/L	4.9	U	U	29	J	J
PCB-189	pg/L	7.02	U,I	UJ	805		
PCB-190	pg/L	30			1230		
PCB-191	pg/L	4.65	J	J	192		
PCB-192	pg/L	4.9	U	U	99.1	U	U
PCB-193	pg/L	10.4			240		
PCB-194	pg/L	90.6			2470		
PCB-195	pg/L	31			690		
PCB-196/203	pg/L	115			2710		
PCB-197	pg/L	4.9	U	U	135		
PCB-198	pg/L	8.84			214		
PCB-199	pg/L	110			1860		
PCB-200	pg/L	14			242		
PCB-201	pg/L	13.3			273		
PCB-202	pg/L	26.8			472		
PCB-204	pg/L	4.9	U	U	23.8	J	J
PCB-205	pg/L	14.6			696		
PCB-206	pg/L	165			5470		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - PCB Congeners

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
PCB-207	pg/L	20.3			619		
PCB-208	pg/L	37.2			635		
PCB-209	pg/L	386			12500		
Total monoCB	pg/L	302			1010000		J
Total diCB	pg/L	1080			797000		
Total triCB	pg/L	1250			241000		
Total tetraCB	pg/L	1450	B		132000	B	
Total pentaCB	pg/L	1450	B		79300	B,I	J
Total hexaCB	pg/L	1300	B		43700	B	
Total heptaCB	pg/L	907	I	J	23100		
Total octaCB	pg/L	424			9780		
Total nonaCB	pg/L	222			6720		
Total decaCB	pg/L	386			12500		
Total PCB	pg/L	8780	B		2350000	B	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1222 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-27	LQ	VQ	PRR1WATCMI-27	LQ	VQ
2,3,7,8-TCDD	pg/L	58.5			3350		
1,2,3,7,8-PeCDD	pg/L	1.81	U	U	82.9		
1,2,3,4,7,8-HxCDD	pg/L	1.04	U	U	53.3		
1,2,3,6,7,8-HxCDD	pg/L	2.5	J	J	110		
1,2,3,7,8,9-HxCDD	pg/L	1.25	U	U	49.8		
1,2,3,4,6,7,8-HpCDD	pg/L	9.4	J	J	448		
OCDD	pg/L	79			4110		
Total TCDD	pg/L	93.7			6750		
Total PeCDD	pg/L	16			2010		
Total HxCDD	pg/L	21.6			1600		
Total HpCDD	pg/L	9.4			1100		
2,3,7,8-TCDF	pg/L	2.35	U	U	116		
1,2,3,7,8-PeCDF	pg/L	3.49	J	J	273		
2,3,4,7,8-PeCDF	pg/L	21	J	J	2080		
1,2,3,4,7,8-HxCDF	pg/L	177			12800		
1,2,3,6,7,8-HxCDF	pg/L	27.2			2160		
1,2,3,7,8,9-HxCDF	pg/L	3.9	EMPC	EMPC	276		
2,3,4,6,7,8-HxCDF	pg/L	11.8	J	J	871		
1,2,3,4,6,7,8-HpCDF	pg/L	389			25300	E	EJ
1,2,3,4,7,8,9-HpCDF	pg/L	19.9	J	J	1370		
OCDF	pg/L	577			40100	E	EJ
Total TCDF	pg/L	147			15500		
Total PeCDF	pg/L	219			16500		
Total HxCDF	pg/L	362			26000		
Total HpCDF	pg/L	467			30300		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	92.7			5990		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1WATCME-27 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33726-001	Date Received:	19-Apr-12
Project:	PRR1222	Sample Size:	1.03 L	QC Batch No.:	4388	Date Extracted:	19-Apr-12
Date Collected:	18-Apr-12			Date Analyzed DB-5:	20-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1130						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	58.5			
1,2,3,7,8-PeCDD	ND	1.81		
1,2,3,4,7,8-HxCDD	ND	1.04		
1,2,3,6,7,8-HxCDD	2.50			J
1,2,3,7,8,9-HxCDD	ND	1.25		
1,2,3,4,6,7,8-HpCDD	9.40			J
OCDD	79.0			
2,3,7,8-TCDF	ND	2.35		
1,2,3,7,8-PeCDF	3.49			J
2,3,4,7,8-PeCDF	21.0			J
1,2,3,4,7,8-HxCDF	177			
1,2,3,6,7,8-HxCDF	27.2			
2,3,4,6,7,8-HxCDF	11.8			J
1,2,3,7,8,9-HxCDF	ND		3.90	
1,2,3,4,6,7,8-HpCDF	389			
1,2,3,4,7,8,9-HpCDF	19.9			J
OCDF	577			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	92.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	91.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	83.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	80.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	78.7	23 - 140	
	13C-OCDD	71.4	17 - 157	
	13C-2,3,7,8-TCDF	91.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	87.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	87.9	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	82.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	78.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	83.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	81.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	80.0	26 - 138	
	13C-OCDF	75.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	109	35 - 197	

Totals		
Total TCDD	93.7	
Total PeCDD	16.0	17.6
Total HxCDD	21.6	
Total HpCDD	9.40	20.6
Total TCDF	147	149
Total PeCDF	219	
Total HxCDF	362	366
Total HpCDF	467	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 91.1

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 24-Apr-2012 10:35

Sample ID: PRR1WATCMI-27 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33726-002	Date Received:	19-Apr-12
Project:	PRR1222	Sample Size:	1.01 L	QC Batch No.:	4388	Date Extracted:	19-Apr-12
Date Collected:	18-Apr-12			Date Analyzed DB-5:	20-Apr-12	Dates Analyzed DB-225:	23-Apr-12
Time Collected:	1120						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	3350			
1,2,3,7,8-PeCDD	82.9			
1,2,3,4,7,8-HxCDD	53.3			
1,2,3,6,7,8-HxCDD	110			
1,2,3,7,8,9-HxCDD	49.8			
1,2,3,4,6,7,8-HpCDD	448			
OCDD	4110			
2,3,7,8-TCDF	116			
1,2,3,7,8-PeCDF	273			
2,3,4,7,8-PeCDF	2080			
1,2,3,4,7,8-HxCDF	12800			
1,2,3,6,7,8-HxCDF	2160			
2,3,4,6,7,8-HxCDF	871			
1,2,3,7,8,9-HxCDF	276			
1,2,3,4,6,7,8-HpCDF	25300			E J
1,2,3,4,7,8,9-HpCDF	1370			
OCDF	40100			E J

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	96.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	94.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	86.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	85.4	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	85.5	23 - 140	
	13C-OCDD	77.4	17 - 157	
	13C-2,3,7,8-TCDF	94.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	89.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	90.9	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	86.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	86.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	89.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	93.9	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	87.6	26 - 138	
	13C-OCDF	89.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	120	35 - 197	

Totals	
Total TCDD	6750
Total PeCDD	2010
Total HxCDD	1600
Total HpCDD	1100
Total TCDF	15500
Total PeCDF	16500
Total HxCDF	26000
Total HpCDF	30300

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 5990

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 24-Apr-2012 10:35

Sample ID:	PRR1WATCME-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-001	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.02 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12	%Solids: 1.26	Date Analyzed DB-1 20-Apr-12	
Time Collected:	1130			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	137	4.90	
PCB-2	82.9	4.90	
PCB-3	82.9	4.90	
PCB-4/10	80.7	9.80	
PCB-5/8	244	9.80	
PCB-6	68.2	9.80	
PCB-7/9	170	9.80	
PCB-11	48.3	9.80	
PCB-12/13	291	9.80	
PCB-14	125	9.80	
PCB-15	56.0	9.80	
PCB-16/32	66.5	4.90	
PCB-17	43.7	4.90	
PCB-18	125	4.90	
PCB-19	9.42	4.90	
PCB-20/21/33	165	4.90	
PCB-22	79.0	4.90	
PCB-23	30.9	4.90	
PCB-24/27	67.4	4.90	
PCB-25	17.1	4.90	
PCB-26	36.0	4.90	
PCB-28	146	4.90	
PCB-29	18.7	4.90	
PCB-30	ND	4.90	
PCB-31	198	4.90	
PCB-34	22.0	4.90	
PCB-35	33.7	4.90	
PCB-36	12.7	4.90	
PCB-37	149	4.90	
PCB-38	ND	4.90	
PCB-39	29.2	4.90	
PCB-40	26.5	4.90	
PCB-41/64/71/72	136	4.90	
PCB-42/59	49.9	4.90	
PCB-43/49	135	4.90	
PCB-44	161	4.90	
PCB-45	25.1	4.90	
PCB-46	11.4	4.90	
PCB-47	47.5	4.90	
PCB-48/75	37.3	4.90	
PCB-50	ND	4.90	
PCB-51	10.9	4.90	
PCB-52/69	179	4.90	
PCB-53	27.9	4.90	
PCB-54	ND	4.90	
PCB-55	ND	4.90	
PCB-56/60	115	4.90	
PCB-57	ND	4.90	
PCB-58	ND	4.90	
PCB-61/70	196	4.90	
PCB-62	ND	4.90	
PCB-63	11.0	4.90	
PCB-65	ND	4.90	
PCB-67	7.94	4.90	
PCB-68	ND	4.90	
PCB-73	ND	4.90	
PCB-74	100	4.90	
PCB-76/66	143	4.90	
PCB-77	25.2	4.90	B
PCB-78	ND	4.90	
PCB-79	8.95	4.90	
PCB-80	ND	4.90	
PCB-81	ND	4.45	*
PCB-82	32.8	4.90	

Sample ID:	PRR1WATCME-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-001	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.02 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12	%Solids: 1.26	Date Analyzed DB-1 20-Apr-12	
Time Collected:	1130			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.90	
PCB-84/92	85.8	4.90	
PCB-85/116	50.2	4.90	
PCB-86	5.32	4.90	
PCB-87/117/125	79.7	4.90	
PCB-88/91	35.9	4.90	
PCB-89	5.11	4.90	
PCB-90/101	223	4.90	
PCB-93	ND	4.90	
PCB-94	ND	4.90	
PCB-95/98/102	162	4.90	
PCB-96	ND	4.90	
PCB-97	70.3	4.90	
PCB-99	114	4.90	
PCB-100	ND	4.90	
PCB-103	ND	4.90	
PCB-104	ND	4.90	
PCB-105	70.9	4.90	
PCB-106/118	206	4.90	B
PCB-107/109	16.5	4.90	
PCB-108/112	11.1	4.90	
PCB-110	240	4.90	
PCB-111/115	6.14	4.90	
PCB-113	ND	4.90	
PCB-114	15.5	4.90	
PCB-119	6.50	4.90	
PCB-120	ND	4.90	
PCB-121	ND	4.90	
PCB-122	ND	4.90	
PCB-123	5.72	4.90	
PCB-124	9.96	4.90	
PCB-126	2.46	4.90	J

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	4.90	
PCB-128/162	49.5	4.90	
PCB-129	17.2	4.90	
PCB-130	20.3	4.90	
PCB-131	ND	4.90	
PCB-132/161	78.7	4.90	
PCB-133/142	9.50	4.90	
PCB-134/143	16.0	4.90	
PCB-135	27.0	4.90	
PCB-136	37.5	4.90	
PCB-137	18.6	4.90	
PCB-138/163/164	287	4.90	
PCB-139/149	170	4.90	
PCB-140	ND	4.90	
PCB-141	65.7	4.90	
PCB-144	12.0	4.90	
PCB-145	ND	4.90	
PCB-146/165	39.3	4.90	
PCB-147	5.68	4.90	
PCB-148	ND	4.90	
PCB-150	ND	4.90	
PCB-151	50.1	4.90	
PCB-152	ND	4.90	
PCB-153	267	4.90	
PCB-154	7.03	4.90	
PCB-155	5.73	4.90	
PCB-156	54.7	4.90	B
PCB-157	9.48	4.90	
PCB-158/160	36.6	4.90	
PCB-159	ND	4.90	
PCB-166	ND	4.90	
PCB-167	17.3	4.90	

Sample ID:	PRR1WATCME-27		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-001
Project:	PRR1222	Sample Size: 1.02 L	QC Batch No.: 4387
Date Collected:	18-Apr-12	%Solids: 1.26	Date Analyzed DB-1: 20-Apr-12
Time Collected:	1130		Date Received: 19-Apr-12
			Date Extracted: 19-Apr-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	4.90	
PCB-169	ND	1.28	~~*~~
PCB-170	97.9	4.90	
PCB-171	26.6	4.90	
PCB-172	16.5	4.90	
PCB-173	ND	4.90	
PCB-174	107	4.90	
PCB-175	6.73	4.90	
PCB-176	15.1	4.90	
PCB-177	56.4	4.90	
PCB-178	21.7	4.90	
PCB-179	52.8	4.90	
PCB-180	239	4.90	
PCB-181	ND	4.90	
PCB-182/187	142	4.90	
PCB-183	64.6	4.90	
PCB-184	ND	4.90	
PCB-185	16.3	4.90	
PCB-186	ND	4.90	
PCB-188	ND	4.90	
PCB-189	ND	7.02	~~I~~ J
PCB-190	30.0	4.90	
PCB-191	4.65	4.90	J
PCB-192	ND	4.90	
PCB-193	10.4	4.90	
PCB-194	90.6	4.90	
PCB-195	31.0	4.90	
PCB-196/203	115	4.90	
PCB-197	ND	4.90	
PCB-198	8.84	4.90	
PCB-199	110	4.90	
PCB-200	14.0	4.90	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	13.3	4.90	
PCB-202	26.8	4.90	
PCB-204	ND	4.90	
PCB-205	14.6	4.90	
PCB-206	165	4.90	
PCB-207	20.3	4.90	
PCB-208	37.2	4.90	
PCB-209	386	4.90	
Total monoCB	302	4.90	
Total diCB	1080	9.80	
Total triCB	1250	4.90	
Total tetraCB	1450	4.90	~~B~~
Total pentaCB	1450	4.90	~~B~~
Total hexaCB	1300	4.90	~~B~~
Total heptaCB	907	4.90	~~I~~ J
Total octaCB	424	4.90	
Total nonaCB	222	4.90	
Total decaCB	386	4.90	
Total PCB	8780	9.80	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: **0.260**

Sample ID:	PRR1WATCME-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-001	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.02 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12		Date Analyzed 20-Apr-12	
Time Collected:	1130			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-1	64.4	25	150	
	13C-PCB-3	72.1	25	150	
	13C-PCB-4	59.4	25	150	
	13C-PCB-11	70.1	25	150	
	13C-PCB-9	63.8	25	150	
	13C-PCB-19	86.4	25	150	
	13C-PCB-28	66.6	25	150	
	13C-PCB-32	86.8	25	150	
	13C-PCB-37	82.5	25	150	
	13C-PCB-47	71.3	25	150	
	13C-PCB-52	66.7	25	150	
	13C-PCB-54	61.3	25	150	
	13C-PCB-70	68.0	25	150	
	13C-PCB-77	73.6	25	150	
	13C-PCB-80	65.8	25	150	
	13C-PCB-81	73.2	25	150	
	13C-PCB-95	68.0	25	150	
	13C-PCB-97	72.1	25	150	
	13C-PCB-101	71.1	25	150	
	13C-PCB-104	67.6	25	150	
	13C-PCB-105	73.7	25	150	
	13C-PCB-114	69.4	25	150	
	13C-PCB-118	70.6	25	150	
	13C-PCB-123	76.7	25	150	
	13C-PCB-126	79.8	25	150	
	13C-PCB-127	75.3	25	150	
	13C-PCB-138	70.2	25	150	
	13C-PCB-141	71.2	25	150	
	13C-PCB-153	68.6	25	150	
	13C-PCB-155	68.5	25	150	

Chemist: DMS

Approved by: Calvin Tanaka 24-Apr-2012 15:42

Sample ID:	PRR1WATCME-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-001	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.02 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12		Date Analyzed 20-Apr-12	
Time Collected:	1130			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-156	70.6	25	150	
	13C-PCB-157	69.2	25	150	
	13C-PCB-159	70.0	25	150	
	13C-PCB-167	72.7	25	150	
	13C-PCB-169	73.5	25	150	
	13C-PCB-170	71.7	25	150	
	13C-PCB-180	73.7	25	150	
	13C-PCB-188	62.3	25	150	
	13C-PCB-189	71.7	25	150	
	13C-PCB-194	68.9	25	150	
	13C-PCB-202	65.2	25	150	
	13C-PCB-206	61.0	25	150	
	13C-PCB-208	59.4	25	150	
	13C-PCB-209	65.4	25	150	
CRS	13C-PCB-79	78.9	30	135	
	13C-PCB-178	78.8	30	135	

Chemist: DMS

Approved by: Calvin Tanaka 24-Apr-2012 15:42

Sample ID:	PRR1WATCMI-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-002	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.01 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12	%Solids: 1.29	Date Analyzed DB-1 23-Apr-12	
Time Collected:	1120			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	618000	99.1	E J
PCB-2	283000	99.1	
PCB-3	109000	99.1	
PCB-4/10	75100	198	
PCB-5/8	175000	198	
PCB-6	46500	198	
PCB-7/9	132000	198	
PCB-11	14600	198	
PCB-12/13	253000	198	
PCB-14	77500	198	
PCB-15	23800	198	
PCB-16/32	13200	99.1	
PCB-17	9070	99.1	
PCB-18	26200	99.1	
PCB-19	2140	99.1	
PCB-20/21/33	28300	99.1	
PCB-22	12700	99.1	
PCB-23	7100	99.1	
PCB-24/27	25800	99.1	
PCB-25	2350	99.1	
PCB-26	5840	99.1	
PCB-28	26700	99.1	
PCB-29	4120	99.1	
PCB-30	1520	99.1	
PCB-31	26700	99.1	
PCB-34	4350	99.1	
PCB-35	7070	99.1	
PCB-36	2270	99.1	
PCB-37	28500	99.1	
PCB-38	861	99.1	
PCB-39	5830	99.1	
PCB-40	2450	99.1	
PCB-41/64/71/72	13000	99.1	
PCB-42/59	4340	99.1	
PCB-43/49	11600	99.1	
PCB-44	14300	99.1	
PCB-45	2690	99.1	
PCB-46	1230	99.1	
PCB-47	4280	99.1	
PCB-48/75	3470	99.1	
PCB-50	81.9	99.1	J
PCB-51	940	99.1	
PCB-52/69	15200	99.1	
PCB-53	2560	99.1	
PCB-54	76.1	99.1	J
PCB-55	278	99.1	
PCB-56/60	9830	99.1	
PCB-57	165	99.1	
PCB-58	124	99.1	
PCB-61/70	16000	99.1	
PCB-62	79.6	99.1	J
PCB-63	1010	99.1	
PCB-65	50.9	99.1	J
PCB-67	592	99.1	
PCB-68	138	99.1	
PCB-73	ND	99.1	
PCB-74	10700	99.1	
PCB-76/66	13100	99.1	
PCB-77	2230	99.1	~~B~~
PCB-78	ND	99.1	
PCB-79	819	99.1	
PCB-80	103	99.1	
PCB-81	141	99.1	~~B~~
PCB-82	1670	99.1	

Sample ID:	PRR1WATCMI-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-002	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.01 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12	%Solids: 1.29	Date Analyzed DB-1 23-Apr-12	
Time Collected:	1120			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	40.4	99.1	J
PCB-84/92	4770	99.1	
PCB-85/116	1810	99.1	
PCB-86	307	99.1	
PCB-87/117/125	4100	99.1	
PCB-88/91	1950	99.1	
PCB-89	250	99.1	
PCB-90/101	11300	99.1	
PCB-93	ND	99.1	
PCB-94	156	99.1	
PCB-95/98/102	9450	99.1	
PCB-96	172	99.1	
PCB-97	3460	99.1	
PCB-99	6410	99.1	
PCB-100	142	99.1	
PCB-103	154	99.1	
PCB-104	ND	99.1	
PCB-105	3810	99.1	
PCB-106/118	11900	99.1	~~B~~
PCB-107/109	871	99.1	
PCB-108/112	588	99.1	
PCB-110	12300	99.1	
PCB-111/115	439	99.1	
PCB-113	ND	99.1	
PCB-114	1760	99.1	
PCB-119	362	99.1	
PCB-120	101	99.1	
PCB-121	ND	99.1	
PCB-122	155	99.1	
PCB-123	379	99.1	
PCB-124	477	99.1	
PCB-126	ND	176	~~I~~ J

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	99.1	
PCB-128/162	1420	99.1	
PCB-129	562	99.1	
PCB-130	565	99.1	
PCB-131	53.9	99.1	J
PCB-132/161	2440	99.1	
PCB-133/142	305	99.1	
PCB-134/143	533	99.1	
PCB-135	948	99.1	
PCB-136	1100	99.1	
PCB-137	808	99.1	
PCB-138/163/164	8770	99.1	
PCB-139/149	5490	99.1	
PCB-140	66.0	99.1	J
PCB-141	2640	99.1	
PCB-144	394	99.1	
PCB-145	ND	99.1	
PCB-146/165	1140	99.1	
PCB-147	193	99.1	
PCB-148	49.1	99.1	J
PCB-150	53.4	99.1	J
PCB-151	1660	99.1	
PCB-152	ND	99.1	
PCB-153	8130	99.1	
PCB-154	209	99.1	
PCB-155	164	99.1	
PCB-156	3110	99.1	~~B~~
PCB-157	360	99.1	
PCB-158/160	1300	99.1	
PCB-159	ND	99.1	
PCB-166	290	99.1	
PCB-167	829	99.1	

Sample ID:	PRR1WATCMI-27		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-002
Project:	PRR1222	Sample Size: 1.01 L	QC Batch No.: 4387
Date Collected:	18-Apr-12	%Solids: 1.29	Date Analyzed DB-1: 23-Apr-12
Time Collected:	1120		Date Received: 19-Apr-12
			Date Extracted: 19-Apr-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	34.9	99.1	J
PCB-169	47.7	99.1	J,B
PCB-170	2510	99.1	
PCB-171	589	99.1	
PCB-172	463	99.1	
PCB-173	124	99.1	
PCB-174	2300	99.1	
PCB-175	165	99.1	
PCB-176	355	99.1	
PCB-177	1200	99.1	
PCB-178	491	99.1	
PCB-179	1140	99.1	
PCB-180	6150	99.1	
PCB-181	46.8	99.1	J
PCB-182/187	3050	99.1	
PCB-183	1480	99.1	
PCB-184	ND	99.1	
PCB-185	522	99.1	
PCB-186	ND	99.1	
PCB-188	29.0	99.1	J
PCB-189	805	99.1	
PCB-190	1230	99.1	
PCB-191	192	99.1	
PCB-192	ND	99.1	
PCB-193	240	99.1	
PCB-194	2470	99.1	
PCB-195	690	99.1	
PCB-196/203	2710	99.1	
PCB-197	135	99.1	
PCB-198	214	99.1	
PCB-199	1860	99.1	
PCB-200	242	99.1	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	273	99.1	
PCB-202	472	99.1	
PCB-204	23.8	99.1	J
PCB-205	696	99.1	
PCB-206	5470	99.1	
PCB-207	619	99.1	
PCB-208	635	99.1	
PCB-209	12500	99.1	
Total monoCB	1010000	99.1	J
Total diCB	797000	198	
Total triCB	241000	99.1	
Total tetraCB	132000	99.1	B
Total pentaCB	79300	99.1	B, ~~I~~ J
Total hexaCB	43700	99.1	B
Total heptaCB	23100	99.1	
Total octaCB	9780	99.1	
Total nonaCB	6720	99.1	
Total decaCB	12500	99.1	
Total PCB	2350000	198	B J

TEQ(WHO-2005 Mammal [(Min)]: **2.38**

Sample ID:	PRR1WATCMI-27			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33726-002	Date Received: 19-Apr-12
Project:	PRR1222	Sample Size: 1.01 L	QC Batch No.: 4387	Date Extracted: 19-Apr-12
Date Collected:	18-Apr-12		Date Analyzed 23-Apr-12	
Time Collected:	1120			

	Internal Standard	% Recovery	LCL	UCL	Qualifier
IS	13C-PCB-1	63.1	25	150	
	13C-PCB-3	60.4	25	150	
	13C-PCB-4	64.8	25	150	
	13C-PCB-11	67.3	25	150	
	13C-PCB-9	65.7	25	150	
	13C-PCB-19	74.7	25	150	
	13C-PCB-28	69.6	25	150	
	13C-PCB-32	76.6	25	150	
	13C-PCB-37	79.6	25	150	
	13C-PCB-47	66.9	25	150	
	13C-PCB-52	63.2	25	150	
	13C-PCB-54	56.1	25	150	
	13C-PCB-70	63.2	25	150	
	13C-PCB-77	64.9	25	150	
	13C-PCB-80	60.5	25	150	
	13C-PCB-81	65.3	25	150	
	13C-PCB-95	61.6	25	150	
	13C-PCB-97	65.9	25	150	
	13C-PCB-101	65.1	25	150	
	13C-PCB-104	64.9	25	150	
	13C-PCB-105	67.8	25	150	
	13C-PCB-114	67.1	25	150	
	13C-PCB-118	66.1	25	150	
	13C-PCB-123	68.9	25	150	
	13C-PCB-126	72.6	25	150	
	13C-PCB-127	69.2	25	150	
	13C-PCB-138	65.6	25	150	
	13C-PCB-141	64.4	25	150	
	13C-PCB-153	66.1	25	150	
	13C-PCB-155	66.8	25	150	

Chemist: DMS

Approved by: Calvin Tanaka 24-Apr-2012 15:42

Sample ID:	PRR1WATCMI-27				EPA Method 1668A
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33726-002
Project:	PRR1222	Sample Size:	1.01 L	QC Batch No.:	4387
Date Collected:	18-Apr-12			Date Analyzed	23-Apr-12
Time Collected:	1120				

	Internal Standard	% Recovery	LCL	UCL	Qualifier
IS	13C-PCB-156	66.5	25	150	
	13C-PCB-157	66.9	25	150	
	13C-PCB-159	64.9	25	150	
	13C-PCB-167	67.2	25	150	
	13C-PCB-169	69.6	25	150	
	13C-PCB-170	69.3	25	150	
	13C-PCB-180	71.7	25	150	
	13C-PCB-188	58.7	25	150	
	13C-PCB-189	70.9	25	150	
	13C-PCB-194	62.0	25	150	
	13C-PCB-202	64.6	25	150	
	13C-PCB-206	57.8	25	150	
	13C-PCB-208	56.2	25	150	
	13C-PCB-209	64.6	25	150	
CRS	13C-PCB-79	68.7	30	135	
	13C-PCB-178	71.8	30	135	

Chemist: DMS

Approved by: Calvin Tanaka 24-Apr-2012 15:42

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33726 2.3°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1222	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-27	4/18/2012	11:30	water	Grab	4	X	X																
PRR1WATCMI-27	4/18/2012	11:20	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples and 15-5 for Influent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
D Moore	4/18/12	1230	Bethina L Benedict		4/19/12	0900
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1224 (200-10456)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17321R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1224 (200-10456) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATSMI-04	200-10456-2	Water	4/21/2012		--[6]	--[6]	--[6]	--[6]	--[6]
PRR1WATSME-04	200-10456-2	Water	4/21/2012		X	X	X	X	X
TB04202012	200-10456-3	Water	4/21/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. SVOC – Semivolatile Organic Compounds by USEPA Method SOM0.1.2
3. PEST/PCB – Pesticides and PCBs by USEPA Method SOM01.2, and Chlorinated Herbicides by USEPA SW846 Method 8151A
4. MET - Metals by USEPA Method ISM01.2
5. MISC – Total Suspended Solids (TSS) by Standard Methods (SM) 2540D, Total Organic Carbon (TOC) by SM 5310B, and Cyanide by USEPA ISM01.2
6. Sample placed on hold.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The chloroform result for sample location PRR1WATSME-04 required qualification as not detected because the chloroform was also detected in the associated trip blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

A dilution re-analysis was performed for sample location PRR1WATSME-04 to bring the methylene chloride concentration within the instrument calibration range. The dilution result for methylene chloride was reported in lieu of the undiluted result.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank or field blank at or above the project quantitation limits (PQL) during volatiles analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as 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).

Sample Location	Compound	Sample Result	Qualification
PRR1WATSME-04	Chloroform	Detected sample results > RL and < BAL	"UB" at detected sample concentration

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATSME-04	Methylene chloride	37 E	51 D	51 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.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The butyl-benzyl phthalate for sample location PRR1WATSME-04 required qualification as not detected because the compound was also detected in the associated method blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

Sample location PRR1WATSME-04 was re-extracted due to unacceptable surrogate recoveries in the associated method blank. The re-extraction results exhibited acceptable surrogate recoveries and were therefore reported in preference to the initial extraction results. See Section 4, Surrogates.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during SVOC analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1WATSME-04	Butyl-benzyl phthalate	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogate recoveries that exceeded the control limits were observed in the laboratory method blank. The laboratory re-extracted the sample and the re-extracted sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits. Therefore, the re-extraction analysis results have been retained in lieu of the initial extraction results.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

Several detected pesticides exhibited results that exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during pesticides analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. 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 Location	Analyte	Sample Result	Qualification
PRR1WATSME-04	alpha-BHC Endosulfan I gamma-Chlordane	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

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.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATSME-04	4,4'-DDD	0.26 E	0.25 D	0.25 D
	4,4'-DDT	0.24 E	0.21 D	0.21 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

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 Location	Compound	%D
PRR1WATSME-04	2,4'-DDE	84.0 %
	2,4'-DDT	29.2 %
	gamma-BHC	390.2 %
	beta-BHC	429.5 %
	Heptachlor	999.9 %
	Dieldrin	476.8 %
	Endrin	42.4 %
	Endrin aldehyde	999.9 %
	alpha-Chlordane	461.0 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN

Control Limit (%D)	Qualification
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blanks or field blank at or above the PQL during PCB analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

The dinoseb result for sample location PRR1WATSME-04 was rejected as unusable due to very poor recovery in the associated LCS. See Section 5, Laboratory Control Sample (LCS).

Minor

The 2,4-DB result for sample location PRR1WATSME-04 exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 7, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during herbicides analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. All compounds associated with the MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

5. LABORATORY CONTROL SAMPLE (LCS)

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 analyses exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	LCS Recovery
PRR1WATSME-04	Dinoseb	< 10%

The laboratory re-extracted the sample along with a second LCS. The dinoseb recovery was less than 10% in the re-extraction LCS as well. Therefore, the initial sample results were reported in lieu of the re-extracted sample results. The criteria used to evaluate the LCS recoveries are presented in the following table. In the case of any LCS deviations, 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

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain any dilutions. The re-analysis was performed due to a low LCS recovery The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan for all non-detected analytes.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The nickel result for sample location PRR1WATCME-21 was qualified as estimated due to serial dilution percent difference exceedance. The nickel result may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during metals analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. The associated sample results were greater than the BAL or were non-detect. Therefore, no qualification of the sample results was required.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS analysis is performed to determine the accuracy of the analytical procedure in a given matrix.

Sample location PRR1WATSME-04 was used in the MS/MSD analysis. The MS analysis exhibited recoveries within the control limits.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data. A control limit of 20% for water matrices and 35% for soil matrices is applied to concentrations that are at least five times the reporting limit (RL). 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.

Sample location PRR1WATSME-04 was used in the laboratory duplicate sample analysis. All analytes associated with laboratory duplicate sample RPDs were within the specified control limit.

6. 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.

Sample location PRR1WATSME-04 was used in the serial dilution analysis. All serial dilutions were within the control limits, with the exception of the analyte presented in the following table. The nickel result for the diluted sample was greater than the nickel result for the undiluted sample.

Sample Location	Analyte	Serial Dilution (%D)
PRR1WATSME-04	Antimony	44 %
	Arsenic	114 %
	Nickel	21 %
	Selenium	100 %

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. The qualifications are applied to all sample results associated with this analytical batch.

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

7. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

11. Overall Assessment

Overall 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.

CYANIDE, TSS, AND TOC DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. Analytes were detected in the associated QA blanks; however, the associated sample results were greater than the BAL 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x) dilution in order to bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based

Qualifier	Description
	on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 28, 2012

PEER REVIEW: Dennis Capria

DATE: October 13, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - PCBs

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
Aroclor-1016	ug/L	0.95	U	U
Aroclor-1221	ug/L	0.95	U	U
Aroclor-1232	ug/L	0.95	U	U
Aroclor-1242	ug/L	0.95	U	U
Aroclor-1248	ug/L	0.95	U	U
Aroclor-1254	ug/L	0.95	U	U
Aroclor-1260	ug/L	0.95	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - Pesticides

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
2,4'-DDD	ug/L	0.081	P	J
2,4'-DDE	ug/L	0.012	P	J
2,4'-DDT	ug/L	0.05	B	
4,4'-DDD	ug/L	0.25	D B	D
4,4'-DDE	ug/L	0.063		
4,4'-DDT	ug/L	0.21	D B	D
Aldrin	ug/L	0.0011	J	J
Alpha-BHC	ug/L	0.0048	J P B	UB
Alpha-Chlordane	ug/L	0.0048	J P	U
Beta-BHC	ug/L	0.024	J P D	U
Delta-BHC	ug/L	0.0048	U	U
Dieldrin	ug/L	0.0048	J P	U
Endosulfan I	ug/L	0.0048	J P B	UB
Endosulfan II	ug/L	0.016		
Endosulfan Sulfate	ug/L	0.00085	J	J
Endrin	ug/L	0.0036	J P	J
Endrin Aldehyde	ug/L	0.0095	J P	U
Gamma-BHC (Lindane)	ug/L	0.0048	J P	U
Gamma-Chlordane	ug/L	0.0048	J P B	UB
Heptachlor	ug/L	0.0048	J P	U
Heptachlor Epoxide	ug/L	0.0061		
Toxaphene	ug/L	0.48	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - Herbicides

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
2,4,5-T	ug/L	2.2		
2,4-D	ug/L	15		
2,4-DB	ug/L	1.6	J p	U
Dinoseb	ug/L		U *	R

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - VOCs

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
1,1,1-Trichloroethane	ug/L	0.5	U	U
1,1,2,2-Tetrachloroethane	ug/L	0.5	U	U
1,1,2-Trichloroethane	ug/L	0.5	U	U
1,1-Dichloroethane	ug/L	0.5	U	U
1,1-Dichloroethene	ug/L	0.5	U	U
1,2,3-Trichlorobenzene	ug/L	0.5	U	U
1,2,4-Trichlorobenzene	ug/L	0.5	U	U
1,2-Dichlorobenzene	ug/L	0.5	U	U
1,2-Dichloroethane	ug/L	0.5	U	U
1,2-Dichloropropane	ug/L	1.2		
1,3-Dichlorobenzene	ug/L	0.5	U	U
1,4-Dichlorobenzene	ug/L	0.5	U	U
2-Butanone	ug/L	14		
Acrolein	ug/L	10	U	U
Acrylonitrile	ug/L	10	U	U
Benzene	ug/L	0.39	J	J
Bromodichloromethane	ug/L	0.5	U	U
Bromoform	ug/L	0.5	U	U
Bromomethane	ug/L	0.5	U	U
Carbon Tetrachloride	ug/L	0.5	U	U
Chlorobenzene	ug/L	0.94		
Chloroethane	ug/L	0.5	U	U
Chloroform	ug/L	3		UB
Chloromethane	ug/L	0.5	U	U
cis-1,3-Dichloropropene	ug/L	0.5	U	U
Dibromochloromethane	ug/L	0.5	U	U
Ethylbenzene	ug/L	0.5	U	U
Methylene Chloride	ug/L	51	D B	D
Tetrachloroethene	ug/L	0.5	U	U
Toluene	ug/L	0.068	J	J
trans-1,2-Dichloroethene	ug/L	0.5	U	U
trans-1,3-Dichloropropene	ug/L	0.5	U	U
Trichloroethene	ug/L	0.5	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - VOCs

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
Vinyl Chloride	ug/L	0.5 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - SVOCs

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U
2,4,5-Trichlorophenol	ug/L	0.29	J	J
2,4,6-Trichlorophenol	ug/L	0.47	J	J
2,4-Dichlorophenol	ug/L	0.43	J	J
2,4-Dimethylphenol	ug/L	4.8	U	U
2,4-Dinitrophenol	ug/L	9.6	U	U
2,4-Dinitrotoluene	ug/L	4.8	U	U
2,6-Dinitrotoluene	ug/L	4.8	U	U
2-Chlorophenol	ug/L	2.5	J	J
2-Nitrophenol	ug/L	4.8	U	U
3,3'-Dichlorobenzidine	ug/L	4.8	U	U
4,6-Dinitro-2-methylphenol	ug/L	9.6	U	U
4-Nitrophenol	ug/L	9.6	U	U
Anthracene	ug/L	4.8	U	U
Benzidine	ug/L	9.6	U	U
Benzo(a)anthracene	ug/L	4.8	U	U
Benzo(a)pyrene	ug/L	4.8	U	U
Benzo(b)fluoranthene	ug/L	4.8	U	U
Benzo(k)fluoranthene	ug/L	4.8	U	U
bis(2-Chloroethyl)ether	ug/L	4.8	U	U
bis(2-Ethylhexyl)phthalate	ug/L	4.8	U	U
Butylbenzylphthalate	ug/L	4.8	J B	UB
Chrysene	ug/L	4.8	U	U
Dibenzo(a,h)anthracene	ug/L	4.8	U	U
Diethylphthalate	ug/L	4.8	U	U
Dimethylphthalate	ug/L	4.8	U	U
Di-n-Butylphthalate	ug/L	4.8	U	U
Fluoranthene	ug/L	4.8	U	U
Fluorene	ug/L	4.8	U	U
Hexachlorobenzene	ug/L	4.8	U	U
Hexachlorobutadiene	ug/L	4.8	U	U
Hexachlorocyclopentadiene	ug/L	4.8	U	U
Hexachloroethane	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - SVOCs

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U
Isophorone	ug/L	4.8	U	U
Naphthalene	ug/L	4.8	U	U
Nitrobenzene	ug/L	4.8	U	U
N-Nitrosodimethylamine	ug/L	9.6	U	U
N-Nitrosodiphenylamine	ug/L	4.8	U	U
Pentachlorophenol	ug/L	9.6	U	U
Phenanthrene	ug/L	4.8	U	U
Phenol	ug/L	0.39	J	J
Pyrene	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - Inorganics

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
Antimony	ug/L	17.5 J E		J
Arsenic	ug/L	8.6 J E		J
Beryllium	ug/L	10 U		U
Cadmium	ug/L	10 U		U
Chromium	ug/L	4.6 J		J
Copper	ug/L	8.7 J		J
Cyanide	ug/L	10 U		U
Lead	ug/L	3.3 J		J
Mercury	ug/L	0.2 U		U
Nickel	ug/L	38.1 E		J
Selenium	ug/L	12.7 J E		J
Silver	ug/L	0.89 J		J
Zinc	ug/L	17.9 J		J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1224 - Miscellaneous

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
Total Organic Carbon	mg/L	5.7	B	
Total Suspended Solids	mg/L	6.8		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	51 ~~37~~ ~~E~~ D	
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	14	
67-66-3	Chloroform	3.0	UB
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.39	J
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	1.2	
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.068	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.94	
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-04DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	1.3	U
75-01-4	Vinyl chloride	1.3	U
74-83-9	Bromomethane	1.3	U
75-00-3	Chloroethane	1.3	U
107-02-8	Acrolein	26	U
75-35-4	1,1-Dichloroethene	1.3	U
75-09-2	Methylene chloride	51	D B
107-13-1	Acrylonitrile	26	U
156-60-5	trans-1,2-Dichloroethene	1.3	U
75-34-3	1,1-Dichloroethane	1.3	U
78-93-3	2-Butanone	19	D
67-66-3	Chloroform	4.0	D
71-55-6	1,1,1-Trichloroethane	1.3	U
56-23-5	Carbon tetrachloride	0.058	J D B
71-43-2	Benzene	0.53	J D
107-06-2	1,2-Dichloroethane	1.3	U
79-01-6	Trichloroethene	1.3	U
78-87-5	1,2-Dichloropropane	1.7	D
75-27-4	Bromodichloromethane	1.3	U
10061-01-5	cis-1,3-Dichloropropene	1.3	U
108-88-3	Toluene	0.10	J D
10061-02-6	trans-1,3-Dichloropropene	1.3	U
79-00-5	1,1,2-Trichloroethane	1.3	U
127-18-4	Tetrachloroethene	1.3	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATSME-04DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.3	U
108-90-7	Chlorobenzene	1.2	J D
100-41-4	Ethylbenzene	1.3	U
75-25-2	Bromoform	1.3	U
79-34-5	1,1,2,2-Tetrachloroethane	1.3	U
541-73-1	1,3-Dichlorobenzene	1.3	U
106-46-7	1,4-Dichlorobenzene	1.3	U
95-50-1	1,2-Dichlorobenzene	1.3	U
120-82-1	1,2,4-Trichlorobenzene	1.3	U
87-61-6	1,2,3-Trichlorobenzene	1.3	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04202012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.088	J
107-13-1	Acrylonitrile	0.60	J
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	5.3	
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	2.7	
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.054	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04202012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.77	
108-90-7	Chlorobenzene	0.065	J
100-41-4	Ethylbenzene	0.061	J
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.
PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: RJYRU05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/26/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.7	U
108-95-2	Phenol	0.39	J
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	2.1	J
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	0.44	J
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	0.54	J
95-95-4	2,4,5-Trichlorophenol	0.40	J
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.7	U
100-02-7	4-Nitrophenol	9.7	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	0.34	J
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.7	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.7	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	0.069	J B
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.7	U
129-00-0	Pyrene	4.8	U

1E - FORM I SV-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: RJYRU05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 04/26/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8	U
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	0.22	J B
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJYSV05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/26/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.6	U
108-95-2	Phenol	0.39	J
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	2.5	J
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	0.43	J
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	0.47	J
95-95-4	2,4,5-Trichlorophenol	0.29	J
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.6	U
100-02-7	4-Nitrophenol	9.6	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	4.8	U
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.6	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.6	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8	U
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.6	U
129-00-0	Pyrene	4.8	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-04RX

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: RJYSV05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 04/26/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/04/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8 ~~0.12~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	4.8	U
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 24AP121325-R061.D

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.012	~~P~~ J
789-02-6	2,4'-DDT	0.050	~~P~~
53-19-0	2,4'-DDD	0.081	~~P~~ J

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 24AP121839-R071.D

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Extraction: (Type) SEPF Date Extracted: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q	
319-84-6	alpha-BHC	0.0048 ~~0.00021~~	~~J P B~~	UB
319-85-7	beta-BHC	0.024 ~~0.0049~~	~~P~~	U
319-86-8	delta-BHC	0.0048	U	
58-89-9	gamma-BHC (Lindane)	0.0048 ~~0.00035~~	~~J P~~	U
76-44-8	Heptachlor	0.0048 ~~0.00067~~	~~J P~~	U
309-00-2	Aldrin	0.0011	J	
1024-57-3	Heptachlor epoxide	0.0061		
959-98-8	Endosulfan I	0.0048 ~~0.0044~~	~~J P B~~	UB
60-57-1	Dieldrin	0.0048 ~~0.00029~~	~~J P~~	U
72-55-9	4,4'-DDE	0.063		
72-20-8	Endrin	0.0036	J ~~P~~	
33213-65-9	Endosulfan II	0.016		
72-54-8	4,4'-DDD	0.25 ~~0.26~~	~~E B~~	D
1031-07-8	Endosulfan sulfate	0.00085	J	
50-29-3	4,4'-DDT	0.21 ~~0.24~~	~~E P B~~	D
7421-93-4	Endrin aldehyde	0.0096 ~~0.00042~~	~~J P~~	U
5103-71-9	alpha-Chlordane	0.0048 ~~0.0024~~	~~J P~~	U
5103-74-2	gamma-Chlordane	0.0048 ~~0.0029~~	~~J P B~~	UB
8001-35-2	Toxaphene	0.48	U	

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATSME-04DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 24AP121839-R061.D

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Extraction: (Type) SEPF Date Extracted: 04/23/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/24/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.024	U
319-85-7	beta-BHC	0.0053	J P D
319-86-8	delta-BHC	0.024	U
58-89-9	gamma-BHC (Lindane)	0.024	U
76-44-8	Heptachlor	0.00048	J P D
309-00-2	Aldrin	0.0011	J D
1024-57-3	Heptachlor epoxide	0.0059	J P D
959-98-8	Endosulfan I	0.048 ~~0.0049~~	~~J P D~~ ~~B~~ UB
60-57-1	Dieldrin	0.048	U
72-55-9	4,4'-DDE	0.057	D
72-20-8	Endrin	0.0047	J D
33213-65-9	Endosulfan II	0.015	J P D
72-54-8	4,4'-DDD	0.25	D ~~B~~
1031-07-8	Endosulfan sulfate	0.048	U
50-29-3	4,4'-DDT	0.21	D ~~B~~
7421-93-4	Endrin aldehyde	0.048	U
5103-71-9	alpha-Chlordane	0.0024	J P D
5103-74-2	gamma-Chlordane	0.048 ~~0.0030~~	~~J P D~~ ~~B~~ UB
8001-35-2	Toxaphene	2.4	U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1224

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10456-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 23AP122013-R091.D

% Moisture: Decanted: (Y/N) Date Received: 04/23/2012

Extraction: (Type) SEPF Date Extracted: 04/23/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 04/23/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.95	U
11104-28-2	Aroclor-1221	0.95	U
11141-16-5	Aroclor-1232	0.95	U
53469-21-9	Aroclor-1242	0.95	U
12672-29-6	Aroclor-1248	0.95	U
11097-69-1	Aroclor-1254	0.95	U
11096-82-5	Aroclor-1260	0.95	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10456-3

SDG No.: PRR1224

Client Sample ID: PRR1WATSME-04 Lab Sample ID: 200-10456-2

Matrix: Water Lab File ID: 24ap121623-r191.d

Analysis Method: 8151A Date Collected: 04/21/2012 14:25

Extraction Method: 8151A Date Extracted: 04/23/2012 17:26

Sample wt/vol: 1050(mL) Date Analyzed: 04/25/2012 09:42

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37616 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	1.6 ~~0.45~~	~~J p~~ U	1.6	0.45
88-85-7	Dinoseb	~~0.90~~	~~U *~~ R	~~0.90~~	~~0.18~~
93-76-5	2,4,5-T	2.2		0.45	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	83		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10456-3

SDG No.: PRR1224

Client Sample ID: PRR1WATSME-04 Lab Sample ID: 200-10456-2

Matrix: Water Lab File ID: 24ap121623-r191.d

Analysis Method: 8151A Date Collected: 04/21/2012 14:25

Extraction Method: 8151A Date Extracted: 04/23/2012 17:26

Sample wt/vol: 1050(mL) Date Analyzed: 04/25/2012 09:42

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37616 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	15		1.8	0.62

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	84		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10456-3

SDG No.: PRR1224

Client Sample ID: PRR1WATSME-04 RE Lab Sample ID: 200-10456-2 RE

Matrix: Water Lab File ID: 26ap121624-r031.d

Analysis Method: 8151A Date Collected: 04/21/2012 14:25

Extraction Method: 8151A Date Extracted: 04/25/2012 17:38

Sample wt/vol: 1050(mL) Date Analyzed: 04/27/2012 03:08

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	*2,4-DB*	*0.48*	*J p*	*1.6*	*0.45*
88-85-7	*Dinoseb*	*0.90*	*U **	*0.90*	*0.18*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	85		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington | Job No.: 200-10456-3

SDG No.: PRR1224

Client Sample ID: PRR1WATSME-04 RE | Lab Sample ID: 200-10456-2 RE

Matrix: Water | Lab File ID: 26ap121624-r031.d

Analysis Method: 8151A | Date Collected: 04/21/2012 14:25

Extraction Method: 8151A | Date Extracted: 04/25/2012 17:38

Sample wt/vol: 1050(mL) | Date Analyzed: 04/27/2012 03:08

Con. Extract Vol.: 10000(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 37700 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	*2,4-D*	*15*		*1.8*	*0.62*
93-76-5	*2,4,5-T*	*2.2*		*0.45*	*0.12*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	89		60-130

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-04 Lab Sample ID: 200-10456-2

Lab Name: TestAmerica Burlington Job No.: 200-10456-3

SDG ID.: PRR1224

Matrix: Water Date Sampled: 04/21/2012 14:25

Reporting Basis: WET Date Received: 04/23/2012 09:55

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	5.7	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSME-04 Lab Sample ID: 200-10456-2

Lab Name: TestAmerica Burlington Job No.: 200-10456-2

SDG ID.: PRR1224

Matrix: Water Date Sampled: 04/21/2012 14:25

Reporting Basis: WET Date Received: 04/23/2012 09:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.8	0.52		mg/L			1	SM 2540D

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON | Contract: LPRSA
Lab Code: TABVT | Case No.: RAPHASI | Mod. Ref. No.: | SDG No.: PRR1224
Matrix: WATER | Lab Sample Id: 200-10456-2
% Solids: | Date Received: 04/23/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	17.5	J	~~E~~	MS
7440-38-2	Arsenic	8.6	J	~~E~~	MS
7440-41-7	Beryllium	10.0	U		MS
7440-43-9	Cadmium	10.0	U		MS
7440-47-3	Chromium	4.6	J		MS
7440-50-8	Copper	8.7	J		MS
7439-92-1	Lead	3.3	J		MS
7440-02-0	Nickel	38.1		~~E~~ J	MS
7782-49-2	Selenium	12.7	J	~~E~~	MS
7440-22-4	Silver	0.89	J		MS
7440-66-6	Zinc	17.9	J		MS

Color Before: COLORLESS | Clarity Before: CLEAR | Texture: NA
Color After: COLORLESS | Clarity After: CLEAR | Artifacts: NONE
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1224
Matrix: WATER Lab Sample Id: 200-10456-2
% Solids: Date Received: 04/23/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATSME-04

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1224

Matrix: WATER Lab Sample Id: 200-10456-2

% Solids: Date Received: 04/23/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	10.0	U		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:

Color After: Clarity After: Artifacts:

Comments:

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1224	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATSMI-04	4/20/2012	1415	water	Grab	17	H	H	H	H	H	H	H	H	H									
PRR1WATSME-04	4/20/2012	1425	water	Grab	17	X	X	X	X	X	X	X	X	X									
TB04202012	4/20/2012		water	grab - QC	3				X														

Page 6 of 245

	Requested Analyses
1	TSS
2	TOC
3	SVOCs (See Wksht #15-2 in RAWP QAPP)
4	VOCs (See Wksht #15-2 in RAWP QAPP)
5	Aroclor PCBs (See Wksht #15-2 in RAWP QAPP)
6	Metals (See Wksht #15-2 in RAWP QAPP)
7	Herbicides (See Wksht #15-2 in RAWP QAPP)
8	Pesticides (See Wksht #15-2 in RAWP QAPP)
9	Cyanide(See Wkst#15-2 in RAWP QAPP)
10	
11	
12	
13	
14	
15	
16	
17	
18	

Special Instructions/Comments:
7 day TAT
X: Analyze Now H: Please HOLD sample

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT
Shipping Tracking #
Specify Turnaround Requirements: 7 day TAT

☒ Cooler packed with ice
☒ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp: 5.8C, 2.6°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	04/21/12	1530	[signature] 04/23/12 0955			

05/09/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG# PRR1224 (33735)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17322R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1224 (33735) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1WATSME-04	33735-001	Soil	4/21/2012					X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) or EDLs during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1SOLBF-02 was used in the MS/MSD analysis. The MS/MSD analyses exhibited acceptable recoveries and RPDs between the MS and MSD results.

6. SECOND COLUMN CONFIRMATION

The compound 2,3,7,8-TCDF was detected in sample location PRR1WATSME-04. The confirmation analysis was not reported. The concentration of 2,3,7,8-TCDF was less than the PQL.

7. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.

Qualifier	Description
U/ND	Not Detected.

11. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: September 27, 2012

PEER REVIEW: Dennis Capria

DATE: October 13, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1224 - Dioxins/Furans

ANALYTE	Units	PRR1WATSME-04	LQ	VQ
Dioxins/Furans				
2,3,7,8-TCDD	pg/L	1190		
1,2,3,7,8-PeCDD	pg/L	13.6	J	J
1,2,3,4,7,8-HxCDD	pg/L	3.67	J	J
1,2,3,6,7,8-HxCDD	pg/L	4.93	EMPC	EMPC
1,2,3,7,8,9-HxCDD	pg/L	9.54	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	38.4		
OCDD	pg/L	2480		
2,3,7,8-TCDF	pg/L	3.22	J	J
1,2,3,7,8-PeCDF	pg/L	11.2	J	J
2,3,4,7,8-PeCDF	pg/L	52.7		
1,2,3,4,7,8-HxCDF	pg/L	528		
1,2,3,6,7,8-HxCDF	pg/L	87.8		
1,2,3,7,8,9-HxCDF	pg/L	15.1	J	J
2,3,4,6,7,8-HxCDF	pg/L	37		
1,2,3,4,6,7,8-HpCDF	pg/L	1350		
1,2,3,4,7,8,9-HpCDF	pg/L	103		
OCDF	pg/L	9020		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	1310		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: **PRR1WATSME-04** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33735-001	Date Received:	23-Apr-12
Project:	PRR1224	Sample Size:	1.02 L	QC Batch No.:	4393	Date Extracted:	23-Apr-12
Date Collected:	21-Apr-12			Date Analyzed DB-5:	25-Apr-12	Date Analyzed DB-225:	NA
Time Collected:	1425						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	1190			
1,2,3,7,8-PeCDD	13.6			J
1,2,3,4,7,8-HxCDD	3.67			J
1,2,3,6,7,8-HxCDD	ND		4.93	
1,2,3,7,8,9-HxCDD	ND	9.54		
1,2,3,4,6,7,8-HpCDD	38.4			
OCDD	2480			
2,3,7,8-TCDF	3.22			J
1,2,3,7,8-PeCDF	11.2			J
2,3,4,7,8-PeCDF	52.7			
1,2,3,4,7,8-HxCDF	528			
1,2,3,6,7,8-HxCDF	87.8			
2,3,4,6,7,8-HxCDF	37.0			
1,2,3,7,8,9-HxCDF	15.1			J
1,2,3,4,6,7,8-HpCDF	1350			
1,2,3,4,7,8,9-HpCDF	103			
OCDF	9020			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	85.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	99.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	71.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	78.9	28 - 130	
	13C-1,2,3,4,6,7,8-HpCDD	68.4	23 - 140	
	13C-OCDD	55.5	17 - 157	
	13C-2,3,7,8-TCDF	84.2	24 - 169	
	13C-1,2,3,7,8-PeCDF	98.8	24 - 185	
	13C-2,3,4,7,8-PeCDF	104	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	75.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	74.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	71.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	63.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	65.2	26 - 138	
	13C-OCDF	61.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	104	35 - 197	

Footnotes

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

Analyst: DMS

Approved By: Calvin Tanaka 25-Apr-2012 13:31

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33735 2.9°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1224	

SAMPLERS:

	SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Remarks
*	PRR1WATSMI-04	4/20/2012	1415	water	Grab	2	H																				
	PRR1WATSME-04	4/20/2012	1425	water	Grab	2	X																				

Requested Analyses	
1	Dioxins (17 isomers)
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

7 day TAT

X: Analyze Now H: Please HOLD sample

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista (El Dorado Hills, CA)

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	TIME	Received by:
[signature]	04/21/12	1530	[signature] 4/23/12 0840				

*33736 Sample on Hold

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Infrastructure · Water · Environment · Buildings

Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1232 (200-10451)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17329R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1232 (200-10451) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-10-SP-105	200-10451-1	Water	4/21/2012		X				
PRR1WATGACE-10-SP-108	200-10451-2	Water	4/21/2012		X				
PRR1WATGACE-10-SP-110	200-10451-3	Water	4/21/2012		X				
PRR1WATSP-10-101	200-10451-4	Water	4/21/2012						X
PRR1WATCME-29	200-10451-5	Water	4/21/2012						X
TB4212012	200-10451-6	Water	4/21/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. Chlorobenzene was detected in the laboratory method blank; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACE-10-SP-108	Chlorobenzene	3900 E	3800 D	3800 D
PRR1WATGACI-10-SP-105	Chlorobenzene	28000 E	24000 D	24000 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 1, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 25, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1232 - VOCs

ANALYTE	Units	PRR1WATGACE-10-SP-108	LQ	VQ	PRR1WATGACE-10-SP-110	LQ	VQ	PRR1WATGACI-10	LQ	VQ
2-Butanone	ug/L	280			10	U	U	400	J	J
Chlorobenzene	ug/L	3800	D	D	13			24000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1232 - Miscellaneous

ANALYTE	Units	PRR1WATCME-29	LQ	VQ	PRR1WATSP-10	LQ	VQ
Total Suspended Solids	mg/L	6.4			74		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-10-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1232

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10451-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 33.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	280	
108-90-7	Chlorobenzene	3800 ~~3900~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-10-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1232

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10451-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA19.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 283.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	460	J D
108-90-7	Chlorobenzene	3800	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-10-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1232

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10451-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	13	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-10-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1232

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10451-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 200.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	400	J
108-90-7	Chlorobenzene	24000 ~~28000~~	E ~~D~~

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-10-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1232

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10451-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1692.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	8500	U
108-90-7	Chlorobenzene	24000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB4212012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1232

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10451-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGA23.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/23/2012

% Moisture: not dec. Date Analyzed: 04/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.055	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATSP-10-101 Lab Sample ID: 200-10451-4

Lab Name: TestAmerica Burlington Job No.: 200-10451-2

SDG ID.: PRR1232

Matrix: Water Date Sampled: 04/21/2012 14:00

Reporting Basis: WET Date Received: 04/23/2012 09:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	74.0	2.5		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-29 Lab Sample ID: 200-10451-5

Lab Name: TestAmerica Burlington Job No.: 200-10451-2

SDG ID.: PRR1232

Matrix: Water Date Sampled: 04/21/2012 14:05

Reporting Basis: WET Date Received: 04/23/2012 09:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.4	0.53		mg/L			1	SM 2540D

ARCADIS
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1232	

SAMPLERS: CHES

RS 4/23/12

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WAT1GACISP-105-~~02~~-10-	4/21/2012	1345	water	Grab	4	X	X																
PRR1WATGACESP-108-~~02~~-10-	4/21/2012	1350	water	Grab	4	X	X																
PRR1WATGACESP-110-~~02~~-10-	4/21/2012	1355	water	Grab	4	X	X																
PRR1WATCME-~~30~~ 29	4/21/2012	1400	water	Grab	1			X															
PRR1WATSPE-101-~~09~~	4/21/2012	1405	water	Grab	1			X															
TB04212012 -10-	4/21/2012		water	Grab	3	X																	
(RS 4/23/12)																							

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	~~COD~~
3	~~TSS/TURB~~ (RS) 4/23/12
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 5.6°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/21	1515	[signature]			
[signature]	04/21/12	1530	[signature] TASUN 4/23/12 0955			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1236 (200-10470)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17333R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1236 (200-10470) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-11-SP-105	200-10470-1	Water	4/23/2012		X				
PRR1WATGACE-11-SP-108	200-10470-2	Water	4/23/2012		X				
PRR1WATGACE-11-SP-110	200-10470-3	Water	4/23/2012		X				
PRR1WATCME-30	200-10470-4	Water	4/23/2012						X
PRR1WAT-11-MMF-102	200-10470-5	Water	4/23/2012						X
PRR1WAT-11-MMF-103	200-10470-6	Water	4/23/2012						X
PRR1WATCME-28	200-10470-7	Water	4/19/2012						X
TB04232012	200-10470-8	Water	4/23/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The chlorobenzene result for sample location PRR1WATGACE-11-SP-110 was qualified as not detected due to the presence of chlorobenzene in the associated blank. See Section 2, Blank Contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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 Location	Compound	Sample Result	Qualification
PRR1WATGACE-11-SP-110	Chlorobenzene	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACE-11-SP-108	Chlorobenzene	5000 E	4500 D	4500 D
PRR1WATGACI-11-SP-105	Chlorobenzene	12000 E	11000 D	11000 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 1, 2012

PEER REVIEW: Dennis Capria

DATE: October 14, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1236 - VOCs

ANALYTE	Units	PRR1WATGACE-11-SP-108	LQ	VQ	PRR1WATGACE-11-SP-110	LQ	VQ	PRR1WATGACI-11	LQ	VQ
2-Butanone	ug/L	210	J	J	10	U	U	190	J	J
Chlorobenzene	ug/L	4500	D	D	1	J	UB	11000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1236 - Miscellaneous

ANALYTE	Units	PRR1WAT-11-MMF-102	LQ	VQ	PRR1WAT-11-MMF-103	LQ	VQ	PRR1WATCME-28	LQ	VQ
Total Suspended Solids	mg/L	38.3			10.3			3.2		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1236 - Miscellaneous

ANALYTE	Units	PRR1WATCME-30	LQ	VQ
Total Suspended Solids	mg/L	7.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-11-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1236

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10470-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/24/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 44.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	210	J
108-90-7	Chlorobenzene	4500 ~~5000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-11-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1236

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10470-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/24/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 314.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	420	J D
108-90-7	Chlorobenzene	4500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-11-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1236

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10470-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/24/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10	U
108-90-7	Chlorobenzene	1.0 ~~0.29~~	~~J~~ UB

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-11-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1236

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10470-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/24/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 91.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	190	J
108-90-7	Chlorobenzene	11000 ~~12000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-11-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1236

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10470-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/24/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 647.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	3200	U
108-90-7	Chlorobenzene	11000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04232012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1236

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10470-8

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDGB15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/24/2012

% Moisture: not dec. Date Analyzed: 04/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-30 Lab Sample ID: 200-10470-4

Lab Name: TestAmerica Burlington Job No.: 200-10470-2

SDG ID.: PRR1236

Matrix: Water Date Sampled: 04/23/2012 13:35

Reporting Basis: WET Date Received: 04/24/2012 09:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.4	0.71		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-11-MMF-102 Lab Sample ID: 200-10470-5

Lab Name: TestAmerica Burlington Job No.: 200-10470-2

SDG ID.: PRR1236

Matrix: Water Date Sampled: 04/23/2012 14:00

Reporting Basis: WET Date Received: 04/24/2012 09:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	38.3	1.7		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-11-MMF-103 Lab Sample ID: 200-10470-6

Lab Name: TestAmerica Burlington Job No.: 200-10470-2

SDG ID.: PRR1236

Matrix: Water Date Sampled: 04/23/2012 14:05

Reporting Basis: WET Date Received: 04/24/2012 09:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.3	0.56		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-28 Lab Sample ID: 200-10470-7

Lab Name: TestAmerica Burlington Job No.: 200-10470-2

SDG ID.: PRR1236

Matrix: Water Date Sampled: 04/19/2012 09:30

Reporting Basis: WET Date Received: 04/24/2012 09:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	3.2	0.54		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1236	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-11-SP-105	4/23/2012	13:55	water	Grab	3	X																	
PRR1WATGACE-11-SP-108	4/23/2012	13:40	water	Grab	3	X																	
PRR1WATGACE-11-SP-110	4/23/2012	13:45	water	Grab	3	X																	
PRR1WATCME-30	4/23/2012	13:35	water	Grab	1		X																
PRR1WAT-11-MMF-102	4/23/2012	14:00	water	Grab	1		X																
PRR1WAT-11-MMF-103	4/23/2012	14:05	water	Grab	1		X																
PRR1WATCME-28	4/19/2012	9:30	water	Grab	1		X																
TB04232012	4/23/2012		water	Grab	3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/23/12	1450	[signature]			
[signature]	4/23/12	1530	[signature] 4/24/12 0924			

04/27/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1240 (200-10492-1&2)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17387R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1240 (200-10492-1&2) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-12-SP-105	200-10492-1	Water	4/24/2012		X				
PRR1WATGACE-12-SP-106	200-10492-2	Water	4/24/2012		X				
PRR1WATGACE-12-SP-110	200-10492-3	Water	4/24/2012		X				
PRR1WAT-12-SP-101	200-10492-4	Water	4/24/2012						X
PRR1WATCME-31	200-10492-5	Water	4/24/2012						X
TB04242012	200-10492-6	Water	4/24/2012		X				

1. Volatiles by USEPA SOM0.1.2
2. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis. Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits for all surrogates associated with target compounds.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-12-SP-105	Chlorobenzene	61000 E	57000 D	57000 D
PRR1WATGACE-12-SP-106	Chlorobenzene	1400 E	1400 D	1400 D
PRR1WATGACE-12-SP-110	Chlorobenzene	570 E	560 D	560 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

A MS analysis was not performed on a sample location associated with this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A dupicate analysis was not performed on a sample location associated with this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

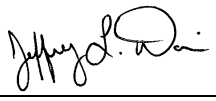
No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: October 1, 2012

PEER REVIEW: Dennis Capria

DATE: October 14, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1240 - VOCs

ANALYTE	Units	PRR1WATGACE-12-SP-106	LQ	VQ	PRR1WATGACE-12-SP-110	LQ	VQ	PRR1WATGACI-12	LQ	VQ
2-Butanone	ug/L	160			130			970	J	J
Chlorobenzene	ug/L	1400	D	D	560	D	D	57000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1240 - Miscellaneous

ANALYTE	Units	PRR1WAT-12	LQ	VQ	PRR1WATCME-31	LQ	VQ
Total Suspended Solids	mg/L	81			26.3		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-12-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 14.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	160	
108-90-7	Chlorobenzene	1400 ~~1400~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-12-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 110.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	200	J D
108-90-7	Chlorobenzene	1400	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-12-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 6.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	130	
108-90-7	Chlorobenzene	560 ~~570~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-12-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 44.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	J D
108-90-7	Chlorobenzene	560	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-12-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 586.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	970	J
108-90-7	Chlorobenzene	57000 ~~61000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-12-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 4400.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	22000	U
108-90-7	Chlorobenzene	57000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04242012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1240

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10492-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJB16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/25/2012

% Moisture: not dec. Date Analyzed: 04/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.063	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-12-SP-101
Lab Sample ID: 200-10492-4
Lab Name: TestAmerica Burlington
Job No.: 200-10492-2
SDG ID.: PRR1240
Matrix: Water
Date Sampled: 04/24/2012 09:15
Reporting Basis: WET
Date Received: 04/25/2012 08:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	81.0	5.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-31 Lab Sample ID: 200-10492-5

Lab Name: TestAmerica Burlington Job No.: 200-10492-2

SDG ID.: PRR1240

Matrix: Water Date Sampled: 04/24/2012 10:05

Reporting Basis: WET Date Received: 04/25/2012 08:35

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	26.3	1.4		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1240	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-12-SP-105	4/24/2012	10:00	water	Grab	3	X																	
PRR1WATGACE-12-SP-106	4/24/2012	9:50	water	Grab	3	X																	
PRR1WATGACE-12-SP-110	4/24/2012	9:45	water	Grab	3	X																	
PRR1WATCME-31	4/24/2012	9:15	water	Grab	1		X																
PRR1WAT-12-SP-101	4/24/2012	10:05	water	Grab	1		X																
TB04242012	4/24/2012		water	Grab	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 3.2°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/24	1700				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/24/12	1730	4/25/12 0835			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

Page 1 of 155

04/27/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1244 (200-10516)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17392R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1244 (200-10516) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-13-SP-105	200-10516-1	Water	4/25/2012		X				
PRR1WATGACE-13-SP-107	200-10516-2	Water	4/25/2012		X				
PRR1WATGACE-13-SP-110	200-10516-3	Water	4/25/2012		X				
PRR1WATCME-32	200-10516-4	Water	4/25/2012						X
PRR1WAT-13-SP-101	200-10516-5	Water	4/25/2012						X
TB04252012	200-10516-6	Water	4/25/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The chlorobenzene result for sample location PRR1WATGACE-13-SP-110 was qualified as not detected due to the presence of chlorobenzene in the associated blank. See Section 2, Blank Contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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 Location	Compound	Sample Result	Qualification
PRR1WATGACE-13-SP-110	Chlorobenzene	Detected sample results < RL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-13-SP-105	Chlorobenzene	47000 E	42000 D	42000 D
PRR1WATGACE-13-SP-107	Chlorobenzene	6700 E	6700 D	6700 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 2, 2012

PEER REVIEW: Dennis Capria

DATE: October 25, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1244 - VOCs

ANALYTE	Units	PRR1WATGACE-13-SP-107	LQ	VQ	PRR1WATGACE-13-SP-110	LQ	VQ	PRR1WATGACI-13	LQ	VQ
2-Butanone	ug/L	290	J	J	0.56	J	J	580	J	J
Chlorobenzene	ug/L	6700	D	D	1	J	UB	42000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1244 - Miscellaneous

ANALYTE	Units	PRR1WAT-13	LQ	VQ	PRR1WATCME-32	LQ	VQ
Total Suspended Solids	mg/L	70.4			28		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-13-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1244

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10516-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 58.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	290	J
108-90-7	Chlorobenzene	6700	~~E~~ ~~B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-13-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1244

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10516-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 440.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	300	J D
108-90-7	Chlorobenzene	6700	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-13-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1244

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10516-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	0.56	J
108-90-7	Chlorobenzene	1.0 ~~0.19~~ ~~J~~ VB	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-13-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1244

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10516-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 440.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	580	J
108-90-7	Chlorobenzene	42000 ~~47000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACI-13-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1244

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10516-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2933.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	830	J D
108-90-7	Chlorobenzene	42000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04252012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1244

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10516-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJD13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/26/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	0.57	J
108-90-7	Chlorobenzene	0.046	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-32 Lab Sample ID: 200-10516-4

Lab Name: TestAmerica Burlington Job No.: 200-10516-2

SDG ID.: PRR1244

Matrix: Water Date Sampled: 04/25/2012 13:25

Reporting Basis: WET Date Received: 04/26/2012 09:16

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	28.0	2.5		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-13-SP-101 Lab Sample ID: 200-10516-5

Lab Name: TestAmerica Burlington Job No.: 200-10516-2

SDG ID.: PRR1244

Matrix: Water Date Sampled: 04/25/2012 13:45

Reporting Basis: WET Date Received: 04/26/2012 09:16

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	70.4	4.0		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
80009966.0002.70004	Tierra Phase I Removal	PRR1244	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-13-SP-105	4/25/2012	13:40	water	Grab	3	X																	
PRR1WATGACE-13-SP-107	4/25/2012	13:35	water	Grab	3	X																	
PRR1WATGACE-13-SP-110	4/25/2012	13:30	water	Grab	3	X																	
PRR1WATCME-32	4/25/2012	13:25	water	Grab	1		X																
PRR1WAT-13-SP-101	4/25/2012	13:45	water	Grab	1		X																
TB04252012	4/25/2012		water	Grab	3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.6 °C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Lea Bruno	4/25/12	1530				
			Received by: 4/26/12 0916	Relinquished by:	DATE	Received by:
	4/25/12	1600				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1248 (200-10546)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17396R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1248 (200-10546) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-14-SP-105	200-10546-1	Water	4/26/2012		X				
PRR1WATGACE-14-SP-107	200-10546-2	Water	4/26/2012		X				
PRR1WATGACE-14-SP-110	200-10546-3	Water	4/26/2012		X				
PRR1WATCME-33	200-10546-4	Water	4/26/2012						X
PRR1WATGACE-14-SP-106	200-10546-5	Water	4/26/2012		X				
TB04262012	200-10546-6	Water	4/26/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan with the exception of the 2-butanone result for sample location PRR1WATGACI-14-SP-105. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACE-14-SP-107	Chlorobenzene	17000 E	15000 D	15000 D
PRR1WATGACE-14-SP-110	Chlorobenzene	12000 E	12000 D	12000 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 2, 2012

PEER REVIEW: Dennis Capria

DATE: October 25, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1248 - VOCs

ANALYTE	Units	PRR1WATGACE-14-SP-106	LQ	VQ	PRR1WATGACE-14-SP-107	LQ	VQ	PRR1WATGACE-14-SP-110	LQ	VQ
2-Butanone	ug/L	5.2	J	J	390	J	J	340	J	J
Chlorobenzene	ug/L	5.6			15000	D	D	12000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1248 - VOCs

ANALYTE	Units	PRR1WATGACI-14	LQ	VQ
2-Butanone	ug/L	22000 U		U
Chlorobenzene	ug/L	59000		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1248 - Miscellaneous

ANALYTE	Units	PRR1WATCME-33	LQ	VQ
Total Suspended Solids	mg/L	16.9		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-14-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 4400.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	22000	U
108-90-7	Chlorobenzene	59000	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-14-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.2	J
108-90-7	Chlorobenzene	5.6	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-14-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 146.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	390	J
108-90-7	Chlorobenzene	15000 ~~17000~~	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-14-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1100.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	520	J D
108-90-7	Chlorobenzene	15000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-14-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 110.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	340	J
108-90-7	Chlorobenzene	12000	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-14-SP

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 800.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	450	J D
108-90-7	Chlorobenzene	12000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04262012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1248

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10546-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJE15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/27/2012

% Moisture: not dec. Date Analyzed: 04/27/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.18	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-33 Lab Sample ID: 200-10546-4

Lab Name: TestAmerica Burlington Job No.: 200-10546-2

SDG ID.: PRR1248

Matrix: Water Date Sampled: 04/26/2012 13:05

Reporting Basis: WET Date Received: 04/27/2012 08:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	16.9	2.0		mg/L			1	SM 2540D

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1248	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-14-SP-105	4/26/2012	13:25	water	Grab	3	X																	
PRR1WATGACE-14-SP-107	4/26/2012	13:15	water	Grab	3	X																	
PRR1WATGACE-14-SP-110	4/26/2012	13:10	water	Grab	3	X																	
PRR1WATCME-33	4/26/2012	13:05	water	Grab	1		X																
PRR1WATGACE-14-SP-106	4/26/2012	13:20	water	Grab	3	X																	
TB04262012	4/26/2012		water	Grab	3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	1600 JK 4/26/12	1600	[signature]			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/26/12	1700	[signature] 1845 4/26/12 1550			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/02/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1252 (200-10581)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17400R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1252 (200-10581) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-15-SP-105	200-10581-1	Water	4/27/2012		X				
PRR1WATGACE-15-SP-107	200-10581-2	Water	4/27/2012						
PRR1WATGACE-15-SP-110	200-10581-3	Water	4/27/2012		X				
PRR1WATCME-34	200-10581-4	Water	4/27/2012						X
PRR1WAT-15-SP-101	200-10581-5	Water	4/27/2012						X
TB04272012	200-10581-6	Water	4/27/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis. Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-15-SP-105	Chlorobenzene	39000 E	32000 D	32000 D
PRR1WATGACE-15-SP-110	Chlorobenzene	8400 E	8500 D	8500 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 2, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 25, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1252 - VOCs

ANALYTE	Units	PRR1WATGACE-15	LQ	VQ	PRR1WATGACI-15	LQ	VQ
2-Butanone	ug/L	300	J	J	550	J	J
Chlorobenzene	ug/L	8500	D	D	32000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1252 - Miscellaneous

ANALYTE	Units	PRR1WAT-15	LQ	VQ	PRR1WATCME-34	LQ	VQ
Total Suspended Solids	mg/L	211			14.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-15-SP-110

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1252

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10581-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/28/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 77.2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	300	J
108-90-7	Chlorobenzene	8500 ~~8400~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-15-SP-110D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TAEVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1252

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10581-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/28/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 550.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	380	J D
108-90-7	Chlorobenzene	8500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-15-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1252

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10581-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/28/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 314.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	550	J
108-90-7	Chlorobenzene	32000 ~~39000~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACI-15-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1252

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10581-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/28/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2200.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	11000	U
108-90-7	Chlorobenzene	32000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04272012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1252

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10581-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/28/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.24	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-34 Lab Sample ID: 200-10581-4

Lab Name: TestAmerica Burlington Job No.: 200-10581-2

SDG ID.: PRR1252

Matrix: Water Date Sampled: 04/27/2012 13:33

Reporting Basis: WET Date Received: 04/28/2012 13:07

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	14.4	1.8		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-15-SP-101 Lab Sample ID: 200-10581-5

Lab Name: TestAmerica Burlington Job No.: 200-10581-2

SDG ID.: PRR1252

Matrix: Water Date Sampled: 04/27/2012 13:57

Reporting Basis: WET Date Received: 04/28/2012 13:07

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	211	7.1		mg/L			1	SM 2540D

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Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR12	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-15-SP-105	4/27/2012	13:50	water	Grab	3	X																	
PRR1WATGACE-15-SP-107	4/27/2012	13:44	water	Grab	3	X																	
PRR1WATGACE-15-SP-110	4/27/2012	13:38	water	Grab	3	X																	
PRR1WATCME-34	4/27/2012	13:33	water	Grab	1		X																
PRR1WAT-15-SP-101	4/27/2012	13:57	water	Grab	1		X																
TB04272012	4/27/2012		water	Grab	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 1.0

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/27/12	1706				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/27/12	1730				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	4/28/12	0945				

05/02/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1256 (200-10595)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17404R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1256 (200-10595) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-16-SP-105	200-10595-1	Water	4/28/2012		X				
PRR1WATGACE-16-SP-107	200-10595-2	Water	4/28/2012						
PRR1WATGACE-16-SP-110	200-10595-3	Water	4/28/2012		X				
PRR1WATCME-35	200-10595-4	Water	4/28/2012						X
PRR1WAT-16-SP-101	200-10595-5	Water	4/28/2012						X
TB04282012	200-10595-6	Water	4/28/2012		X				
PRR1WATGACE-16-SP-106	200-10595-7	Water	4/28/2012						
PRR1WATGACE-16-SP-111	200-10595-8	Water	4/28/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-16-SP-105	Chlorobenzene	51000 E	46000 D	46000 D
PRR1WATGACE-16-SP-110	Chlorobenzene	21000 E	18000 D	18000 D
PRR1WATGACE-16-SP-111	Chlorobenzene	75 E	94 D	94 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 2, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 31, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1256 - VOCs

ANALYTE	Units	PRR1WATGACE-16-SP-110	LQ	VQ	PRR1WATGACE-16-SP-111	LQ	VQ	PRR1WATGACI-16	LQ	VQ
2-Butanone	ug/L	440	J	J	86			490	J	J
Chlorobenzene	ug/L	18000	D	D	94	D	D	46000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1256 - Miscellaneous

ANALYTE	Units	PRR1WAT-16	LQ	VQ	PRR1WATCME-35	LQ	VQ
Total Suspended Solids	mg/L	92			22		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCACE-16-SP-111

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-8

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDHB05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/02/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	86	
108-90-7	Chlorobenzene	94 ~~75~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCACE-16-SP-111D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-8

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI29.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 7.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	56	D
108-90-7	Chlorobenzene	94	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-16-SP-110

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI25.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 176.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	440	J
108-90-7	Chlorobenzene	18000 ~~21000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-16-SP-110D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI24.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1257.1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	530	J D
108-90-7	Chlorobenzene	18000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-16-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI19.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 440.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	490	J
108-90-7	Chlorobenzene	46000 ~~51000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-16-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2933.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	15000	U
108-90-7	Chlorobenzene	46000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB04282012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1256

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10595-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIJI27.D

Level: (TRACE/LOW/MED) TRACE Date Received: 04/30/2012

% Moisture: not dec. Date Analyzed: 05/01/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.35	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-35 Lab Sample ID: 200-10595-4

Lab Name: TestAmerica Burlington Job No.: 200-10595-2

SDG ID.: PRR1256

Matrix: Water Date Sampled: 04/28/2012 15:01

Reporting Basis: WET Date Received: 04/30/2012 09:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	22.0	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-16-SP-101 Lab Sample ID: 200-10595-5

Lab Name: TestAmerica Burlington Job No.: 200-10595-2

SDG ID.: PRR1256

Matrix: Water Date Sampled: 04/28/2012 14:20

Reporting Basis: WET Date Received: 04/30/2012 09:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	92.0	5.0		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1256	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-16-SP-105	4/28/2012	14:25	water	Grab	3	X																	
PRR1WATGACE-16-SP-107	4/28/2012	14:32	water	Grab	3	X																	
PRR1WATGACE-16-SP-110	4/28/2012	14:45	water	Grab	3	X																	
PRR1WATCME-35	4/28/2012	15:01	water	Grab	1		X																
PRR1WAT-16-SP-101	4/28/2012	14:20	water	Grab	1		X																
TB04282012	4/28/2012		water	Grab	3	X																	
PRR1WATGACI-16-SP-106	4/28/2012	14:36	water	Grab	3	X																	LAG
PRR1WATGACI-16-SP-111	4/28/2012	14:50	water	Grab	3	X																	LAG

Requested Analyses

1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.6°C OK!

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	4/28	1515				
[signature]	4/28/12	1530				
	4/30/12	0945	[signature] TA Burl			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1267 (200-10666-1, 200-10666-2, 200-10666-3 and 200-10666-4)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17426R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1267 (200-10666-1, 200-10666-2, 200-10666-3 and 200-10666-4) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-36	200-10666-1	Water	4/30/2012						X
PRR1WATCME-37	200-10666-2	Water	5/3/2012		X	X	X	X	X
TB05032012	200-10666-3	Water	5/3/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of phenol and butylbenzyl phthalate. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

The method blank exhibited concentrations less than the PQL for phenol and butylbenzyl phthalate. These compounds were detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The trip blank exhibited low level concentrations of carbon tetrachloride and toluene. These compounds were detected in the sample at a concentration less than five times the trip blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

The trip blank exhibited concentrations less than the PQL for carbon tetrachloride and toluene. These compounds were detected in sample PRR1WATCME-37 at concentrations less than five times the trip blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-37	Methylene chloride	300 E	290 D	290 D
	Chloroform	51 E	100 D	100 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC and endrin aldehyde. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for beta-BHC and endrin aldehyde. These compounds were detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. 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
PRR1WATCME-37	gamma-BHC	140.9%
	Endosulfan I	117.9%
	Dieldrin	224.1%
	Endrin	182.9%
	Endosulfan II	65.3%
	Heptachlor Epoxide	124.4%

Sample Locations	Compound	%D
	Endosulfan sulfate	110.0%
PRR1WATCME-37DL	alpha-Chlordane	999.9%
	gamma-Chlordane	130.0%
	2,4'-DDE	240.0%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

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
PRR1WATCME-37	Heptachlor	0.14 E	0.14 D	0.14 D
	4,4'-DDE	0.17 E	0.15 JD	0.17 EJ
	4,4'-DDD	0.42 E	0.38 D	0.38 D
	4,4'-DDT	0.49 E	1.7 D	1.7 D
	2,4'-DDT	0.32 E	0.44 D	0.44 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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and

equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-37	2,4-DB	29.9%

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
>25% to 70%	J
>70% to 100%	JN

Control Limit (%D)	Qualification
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

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
PRR1WATCME-37	2,4-D	29 E	29 D	29 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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.

Qualifier	Description
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Silver. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

The LCS recoveries for several compounds were above the control limit. Therefore, positive results for the affected compounds indicate potential high bias.

The serial dilution exhibited a %D above the control limit. Therefore, the affected compounds are qualified as estimated.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Silver. This analyte was detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of

samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. All LCS recoveries were within control limits, with the exception of the analytes associated with sample locations, as presented in the following table.

Sample Location	Analytes	LCS Recovery
PRR1WATCME-37	Antimony	124%
	Cadmium	122%
	Selenium	122%
	Zinc	125%

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

Control limit	Sample Result	Qualification
LCS (water) percent recovery 50% to 79%	Non-detect	UJ
	Detect	J
LCS (water) percent recovery <50%	Non-detect	R
	Detect	J
LCS (water) percent recovery >120%	Non-detect	No Action
	Detect	J
LCS (soil) percent recovery < lower limit	Non-detect	UJ
	Detect	J
LCS (soil) percent recovery > upper limit	Non-detect	No Action
	Detect	J

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location within this SDG.

6. SERIAL 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)
PRR1WATCME-37	Antimony	31%
	Nickel	11%
	Zinc	14%

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

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during TSS analysis. Compounds were detected in the associated QA blanks; however, the associated TOC results were greater than the BAL. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

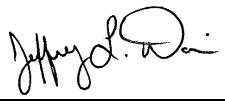
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.

Qualifier	Description
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - PCBs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Aroclor-1016	ug/L	0.96	U	U
Aroclor-1221	ug/L	0.96	U	U
Aroclor-1232	ug/L	0.96	U	U
Aroclor-1242	ug/L	0.96	U	U
Aroclor-1248	ug/L	0.96	U	U
Aroclor-1254	ug/L	0.96	U	U
Aroclor-1260	ug/L	0.96	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Pesticides

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,4'-DDD	ug/L	0.13	P	J
2,4'-DDE	ug/L	0.029	J P D	U
2,4'-DDT	ug/L	0.44	D	D
4,4'-DDD	ug/L	0.38	D	D
4,4'-DDE	ug/L	0.17	E	EJ
4,4'-DDT	ug/L	1.7	D	D
Aldrin	ug/L	0.00083	J P	J
Alpha-BHC	ug/L	0.0049	U	U
Alpha-Chlordane	ug/L	0.098	J P D	U
Beta-BHC	ug/L	0.0083	P B	UB
Delta-BHC	ug/L	0.0049	U	U
Dieldrin	ug/L	0.0098	J P	U
Endosulfan I	ug/L	0.0049	J P	U
Endosulfan II	ug/L	0.0098	J P	U
Endosulfan Sulfate	ug/L	0.0098	J P	U
Endrin	ug/L	0.0098	J P	U
Endrin Aldehyde	ug/L	0.0098	J P B	UB
Gamma-BHC (Lindane)	ug/L	0.0049	J P	U
Gamma-Chlordane	ug/L	0.098	J P D	U
Heptachlor	ug/L	0.14	D	D
Heptachlor Epoxide	ug/L	0.024	P	JN
Toxaphene	ug/L	0.49	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Herbicides

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,4,5-T	ug/L	1.9		
2,4-D	ug/L	29	D	D
2,4-DB	ug/L	4.3		J
Dinoseb	ug/L	0.91	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - VOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	U
1,1,2-Trichloroethane	ug/L	1	U	U
1,1-Dichloroethane	ug/L	1	U	U
1,1-Dichloroethene	ug/L	1	U	U
1,2,3-Trichlorobenzene	ug/L	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U
1,2-Dichlorobenzene	ug/L	0.061	J	J
1,2-Dichloroethane	ug/L	2.2		
1,2-Dichloropropane	ug/L	10		
1,3-Dichlorobenzene	ug/L	1	U	U
1,4-Dichlorobenzene	ug/L	0.11	J	J
2-Butanone	ug/L	100		
Acrolein	ug/L	20	U	U
Acrylonitrile	ug/L	20	U	U
Benzene	ug/L	2.9		
Bromodichloromethane	ug/L	1	U	U
Bromoform	ug/L	1	U	U
Bromomethane	ug/L	1	U	U
Carbon Tetrachloride	ug/L	1	J B	UB
Chlorobenzene	ug/L	7		
Chloroethane	ug/L	1.1		
Chloroform	ug/L	50	D	D
Chloromethane	ug/L	0.39	J	J
cis-1,3-Dichloropropene	ug/L	1	U	U
Dibromochloromethane	ug/L	1	U	U
Ethylbenzene	ug/L	1	U	U
Methylene Chloride	ug/L	290	D B	D
Tetrachloroethene	ug/L	0.079	J	J
Toluene	ug/L	1	J	UB
trans-1,2-Dichloroethene	ug/L	1	U	U
trans-1,3-Dichloropropene	ug/L	1	U	U
Trichloroethene	ug/L	0.039	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - VOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Vinyl Chloride	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - SVOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U
2,4,5-Trichlorophenol	ug/L	4.8	U	U
2,4,6-Trichlorophenol	ug/L	4.8	U	U
2,4-Dichlorophenol	ug/L	4.8	U	U
2,4-Dimethylphenol	ug/L	4.8	U	U
2,4-Dinitrophenol	ug/L	9.6	U	U
2,4-Dinitrotoluene	ug/L	4.8	U	U
2,6-Dinitrotoluene	ug/L	4.8	U	U
2-Chlorophenol	ug/L	5.6		
2-Nitrophenol	ug/L	4.8	U	U
3,3'-Dichlorobenzidine	ug/L	4.8	U	U
4,6-Dinitro-2-methylphenol	ug/L	9.6	U	U
4-Nitrophenol	ug/L	9.6	U	U
Anthracene	ug/L	4.8	U	U
Benzidine	ug/L	9.6	U	U
Benzo(a)anthracene	ug/L	4.8	U	U
Benzo(a)pyrene	ug/L	4.8	U	U
Benzo(b)fluoranthene	ug/L	4.8	U	U
Benzo(k)fluoranthene	ug/L	4.8	U	U
bis(2-Chloroethyl)ether	ug/L	4.8	U	U
bis(2-Ethylhexyl)phthalate	ug/L	0.66	J	J
Butylbenzylphthalate	ug/L	4.8	J B	UB
Chrysene	ug/L	4.8	U	U
Dibenzo(a,h)anthracene	ug/L	4.8	U	U
Diethylphthalate	ug/L	4.8	U	U
Dimethylphthalate	ug/L	4.8	U	U
Di-n-Butylphthalate	ug/L	4.8	U	U
Fluoranthene	ug/L	4.8	U	U
Fluorene	ug/L	4.8	U	U
Hexachlorobenzene	ug/L	4.8	U	U
Hexachlorobutadiene	ug/L	4.8	U	U
Hexachlorocyclopentadiene	ug/L	4.8	U	U
Hexachloroethane	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - SVOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U
Isophorone	ug/L	4.8	U	U
Naphthalene	ug/L	4.8	U	U
Nitrobenzene	ug/L	4.8	U	U
N-Nitrosodimethylamine	ug/L	9.6	U	U
N-Nitrosodiphenylamine	ug/L	4.8	U	U
Pentachlorophenol	ug/L	9.6	U	U
Phenanthrene	ug/L	4.8	U	U
Phenol	ug/L	4.8	J B	UB
Pyrene	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Inorganics

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Antimony	ug/L	7.6	E	J
Arsenic	ug/L	7.1		
Beryllium	ug/L	0.21	J	J
Cadmium	ug/L	1	U	U
Chromium	ug/L	3.9		
Copper	ug/L	3.3		
Cyanide	ug/L	2.6	J	J
Lead	ug/L	2.2		
Mercury	ug/L	0.2	U	U
Nickel	ug/L	36.5	E	J
Selenium	ug/L	12.8		J
Silver	ug/L	1	J	UB
Zinc	ug/L	109	E	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Miscellaneous

ANALYTE	Units	PRR1WATCME-36	LQ	VQ	PRR1WATCME-37	LQ	VQ
Total Organic Carbon	mg/L	NA			18	B	
Total Suspended Solids	mg/L	13.7			11		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: PJCHA08.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/04/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/08/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.6	U
108-95-2	Phenol	4.8 ~~1.2~~	~~J B~~ u8
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	5.6	
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	4.8	U
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	4.8	U
95-95-4	2,4,5-Trichlorophenol	4.8	U
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.6	U
100-02-7	4-Nitrophenol	9.6	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	4.8	U
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.6	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.6	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8	U
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.6	U
129-00-0	Pyrene	4.8	U

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: PJCHA08.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 05/04/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/08/2012

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8 ~~0.47~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	0.66	J
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.39	J
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.1	
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	290 ~~300~~	~~E~~ D
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	100	
67-66-3	Chloroform	50 ~~51~~	~~E~~ D
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0 ~~0.043~~	~~J B~~ UB
71-43-2	Benzene	2.9	
107-06-2	1,2-Dichloroethane	2.2	
79-01-6	Trichloroethene	0.039	J
78-87-5	1,2-Dichloropropane	10	
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0 ~~0.064~~	~~J~~ UB
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	0.079	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	7.0	
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	0.11	J
95-50-1	1,2-Dichlorobenzene	0.061	J
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 20.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
107-02-8	Acrolein	200	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	290	D B
107-13-1	Acrylonitrile	200	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
78-93-3	2-Butanone	100	D
67-66-3	Chloroform	50	D
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	3.1	J D
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	12	D
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 20.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	7.4	J D
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05032012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.31	J
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.017	J B
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.015	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05032012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.054	J
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.016	J
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2
Sample wt/vol: 1020 (g/mL) mL Lab File ID: 09MAY121841-R061.D
% Moisture: Decanted: (Y/N) Date Received: 05/04/2012
Extraction: (Type) SEPF Date Extracted: 05/04/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/09/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.0049	U
319-85-7	beta-BHC	0.0083 ~~0.0083~~	~~P B~~ UB
319-86-8	delta-BHC	0.0049	U
58-89-9	gamma-BHC (Lindane)	0.0049 ~~0.00081~~	~~J P~~ U
76-44-8	Heptachlor	0.14 ~~0.14~~	~~E P~~ D
309-00-2	Aldrin	0.00083	J ~~P~~
1024-57-3	Heptachlor epoxide	0.024	P JN
959-98-8	Endosulfan I	0.0049 ~~0.0026~~	~~J P~~ U
60-57-1	Dieldrin	0.0098 ~~0.00080~~	~~J P~~ U
72-55-9	4,4'-DDE	0.17	E J
72-20-8	Endrin	0.0098 ~~0.0022~~	~~J P~~ U
33213-65-9	Endosulfan II	0.0098 ~~0.0011~~	~~J P~~ U
72-54-8	4,4'-DDD	0.38 ~~0.42~~	~~E~~ D
1031-07-8	Endosulfan sulfate	0.0098 ~~0.0088~~	~~J P~~ U
50-29-3	4,4'-DDT	1.7 ~~0.49~~	~~E~~ D
7421-93-4	Endrin aldehyde	0.0098 ~~0.00066~~	~~J P B~~ UB
5103-71-9	alpha-Chlordane	0.098 ~~0.0064~~	~~P~~ U
5103-74-2	gamma-Chlordane	0.098 ~~0.0060~~	~~P~~ U
8001-35-2	Toxaphene	0.49	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2
Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10MAY120959-R031.D
% Moisture: Decanted: (Y/N) Date Received: 05/04/2012
Extraction: (Type) SEPF Date Extracted: 05/04/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/10/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 20.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.098	U
319-85-7	beta-BHC	0.012	J P D B
319-86-8	delta-BHC	0.098	U
58-89-9	gamma-BHC (Lindane)	0.098	U
76-44-8	Heptachlor	0.14	D
309-00-2	Aldrin	0.098	U
1024-57-3	Heptachlor epoxide	0.032	J P D
959-98-8	Endosulfan I	0.0077	J P D
60-57-1	Dieldrin	0.20	U
72-55-9	4,4'-DDE	0.15	J D
72-20-8	Endrin	0.20	U
33213-65-9	Endosulfan II	0.20	U
72-54-8	4,4'-DDD	0.38	D
1031-07-8	Endosulfan sulfate	0.0087	J P D
50-29-3	4,4'-DDT	1.7	D
7421-93-4	Endrin aldehyde	0.20	U
5103-71-9	alpha-Chlordane	0.0079	J P D
5103-74-2	gamma-Chlordane	0.0084	J P D
8001-35-2	Toxaphene	9.8	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10MAY121355-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/04/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/04/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/10/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.029 ~~0.027~~	~~P~~ U
789-02-6	2,4'-DDT	0.44 ~~0.32~~	~~E P~~ D
53-19-0	2,4'-DDD	0.13	P J

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2
Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10MAY121355-R071.D
% Moisture: Decanted: (Y/N) Date Received: 05/04/2012
Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/04/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/10/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 3.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	~~0.026~~	~~J P D~~
789-02-6	2,4'-DDT	0.44	D
53-19-0	2,4'-DDD	0.13	P D

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 08MAY121830-R041.D

% Moisture: Decanted: (Y/N) Date Received: 05/04/2012

Extraction: (Type) SEPF Date Extracted: 05/04/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/08/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.96	U
11104-28-2	Aroclor-1221	0.96	U
11141-16-5	Aroclor-1232	0.96	U
53469-21-9	Aroclor-1242	0.96	U
12672-29-6	Aroclor-1248	0.96	U
11097-69-1	Aroclor-1254	0.96	U
11096-82-5	Aroclor-1260	0.96	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Matrix: Water Lab File ID: 10may121623-r041.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 04:18

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	29 ~~29~~	~~E~~ D	1.8	0.63
88-85-7	Dinoseb	0.91	U	0.91	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	102		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Matrix: Water Lab File ID: 10may121623-r041.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 04:18

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	4.3	J	1.6	0.45
93-76-5	2,4,5-T	1.9		0.45	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	99		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 DL Lab Sample ID: 200-10666-2 DL

Matrix: Water Lab File ID: 10may121623-r031.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 03:41

Con. Extract Vol.: 10000(uL) Dilution Factor: 2

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	*2,4-D*	*29*	*D*	*3.7*	*1.3*
88-85-7	*Dinoseb*	*1.8*	*U*	*1.8*	*0.37*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	100	*D*	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 DL Lab Sample ID: 200-10666-2 DL

Matrix: Water Lab File ID: 10may121623-r031.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 03:41

Con. Extract Vol.: 10000(uL) Dilution Factor: 2

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	*2,4-DB*	*4.1*	*D*	*3.3*	*0.90*
93-76-5	*2,4,5-T*	*1.8*	*D*	*0.90*	*0.25*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	102	*D*	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1267
Matrix: WATER Lab Sample Id: 200-10666-2
% Solids: Date Received: 05/04/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	7.6		~~E~~ J	MS
7440-38-2	Arsenic	7.1			MS
7440-41-7	Beryllium	0.21	J		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	3.9			MS
7440-50-8	Copper	3.3			MS
7439-92-1	Lead	2.2			MS
7440-02-0	Nickel	36.5		~~E~~ J	MS
7782-49-2	Selenium	12.8		J	MS
7440-22-4	Silver	1.0 ~~0.18~~	~~J~~	UB	MS
7440-66-6	Zinc	109		~~E~~ J	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1267
Matrix: WATER Lab Sample Id: 200-10666-2
% Solids: Date Received: 05/04/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI
Mod. Ref. No.: SDG No.: PRR1267
Matrix: WATER
Lab Sample Id: 200-10666-2
% Solids:
Date Received: 05/04/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	2.6	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG ID.: PRR1267

Matrix: Water Date Sampled: 05/03/2012 09:00

Reporting Basis: WET Date Received: 05/04/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	18.0	2.0	0.28	mg/L		B	2	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-36
Lab Sample ID: 200-10666-1
Lab Name: TestAmerica Burlington
Job No.: 200-10666-4
SDG ID.: PRR1267
Matrix: Water
Date Sampled: 04/30/2012 20:45
Reporting Basis: WET
Date Received: 05/04/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.7	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Lab Name: TestAmerica Burlington Job No.: 200-10666-4

SDG ID.: PRR1267

Matrix: Water Date Sampled: 05/03/2012 09:00

Reporting Basis: WET Date Received: 05/04/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	11.0	1.0		mg/L			1	SM 2540D

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1267	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-36	4/30/2012	20:45	water	Grab	1									X									
PRR1WATCME-37	5/3/2012	9:00	water	Grab	18	X	X	X	X	X	X	X	X	X	X								
TB05032012	5/3/2012		water	—	3		X																

Requested Analyses

1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	WET Testing
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	5/03/12	1100	[signature] TABR 5/4/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/22/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1267 (200-10666-1, 200-10666-2, 200-10666-3 and 200-10666-4)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17426R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1267 (200-10666-1, 200-10666-2, 200-10666-3 and 200-10666-4) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-36	200-10666-1	Water	4/30/2012						X
PRR1WATCME-37	200-10666-2	Water	5/3/2012		X	X	X	X	X
TB05032012	200-10666-3	Water	5/3/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of phenol and butylbenzyl phthalate. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

The method blank exhibited concentrations less than the PQL for phenol and butylbenzyl phthalate. These compounds were detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The trip blank exhibited low level concentrations of carbon tetrachloride and toluene. These compounds were detected in the sample at a concentration less than five times the trip blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

The trip blank exhibited concentrations less than the PQL for carbon tetrachloride and toluene. These compounds were detected in sample PRR1WATCME-37 at concentrations less than five times the trip blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-37	Methylene chloride	300 E	290 D	290 D
	Chloroform	51 E	100 D	100 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of beta-BHC and endrin aldehyde. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for beta-BHC and endrin aldehyde. These compounds were detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. 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
PRR1WATCME-37	gamma-BHC	140.9%
	Endosulfan I	117.9%
	Dieldrin	224.1%
	Endrin	182.9%
	Endosulfan II	65.3%
	Heptachlor Epoxide	124.4%

Sample Locations	Compound	%D
	Endosulfan sulfate	110.0%
PRR1WATCME-37DL	alpha-Chlordane	999.9%
	gamma-Chlordane	130.0%
	2,4'-DDE	240.0%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

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
PRR1WATCME-37	Heptachlor	0.14 E	0.14 D	0.14 D
	4,4'-DDE	0.17 E	0.15 JD	0.17 EJ
	4,4'-DDD	0.42 E	0.38 D	0.38 D
	4,4'-DDT	0.49 E	1.7 D	1.7 D
	2,4'-DDT	0.32 E	0.44 D	0.44 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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and

equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-37	2,4-DB	29.9%

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
>25% to 70%	J
>70% to 100%	JN

Control Limit (%D)	Qualification
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

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
PRR1WATCME-37	2,4-D	29 E	29 D	29 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

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.

Qualifier	Description
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of Silver. This analyte was detected in the sample at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination.

The LCS recoveries for several compounds were above the control limit. Therefore, positive results for the affected compounds indicate potential high bias.

The serial dilution exhibited a %D above the control limit. Therefore, the affected compounds are qualified as estimated.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for Silver. This analyte was detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, this analyte in the sample is most likely from laboratory contamination. The sample result is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of

samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. All LCS recoveries were within control limits, with the exception of the analytes associated with sample locations, as presented in the following table.

Sample Location	Analytes	LCS Recovery
PRR1WATCME-37	Antimony	124%
	Cadmium	122%
	Selenium	122%
	Zinc	125%

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

Control limit	Sample Result	Qualification
LCS (water) percent recovery 50% to 79%	Non-detect	UJ
	Detect	J
LCS (water) percent recovery <50%	Non-detect	R
	Detect	J
LCS (water) percent recovery >120%	Non-detect	No Action
	Detect	J
LCS (soil) percent recovery < lower limit	Non-detect	UJ
	Detect	J
LCS (soil) percent recovery > upper limit	Non-detect	No Action
	Detect	J

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location within this SDG.

6. SERIAL 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)
PRR1WATCME-37	Antimony	31%
	Nickel	11%
	Zinc	14%

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

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during TSS analysis. Compounds were detected in the associated QA blanks; however, the associated TOC results were greater than the BAL. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

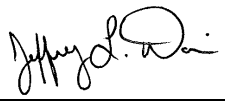
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.

Qualifier	Description
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - PCBs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Aroclor-1016	ug/L	0.96	U	U
Aroclor-1221	ug/L	0.96	U	U
Aroclor-1232	ug/L	0.96	U	U
Aroclor-1242	ug/L	0.96	U	U
Aroclor-1248	ug/L	0.96	U	U
Aroclor-1254	ug/L	0.96	U	U
Aroclor-1260	ug/L	0.96	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Pesticides

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,4'-DDD	ug/L	0.13	P	J
2,4'-DDE	ug/L	0.029	J P D	U
2,4'-DDT	ug/L	0.44	D	D
4,4'-DDD	ug/L	0.38	D	D
4,4'-DDE	ug/L	0.17	E	EJ
4,4'-DDT	ug/L	1.7	D	D
Aldrin	ug/L	0.00083	J P	J
Alpha-BHC	ug/L	0.0049	U	U
Alpha-Chlordane	ug/L	0.098	J P D	U
Beta-BHC	ug/L	0.0083	P B	UB
Delta-BHC	ug/L	0.0049	U	U
Dieldrin	ug/L	0.0098	J P	U
Endosulfan I	ug/L	0.0049	J P	U
Endosulfan II	ug/L	0.0098	J P	U
Endosulfan Sulfate	ug/L	0.0098	J P	U
Endrin	ug/L	0.0098	J P	U
Endrin Aldehyde	ug/L	0.0098	J P B	UB
Gamma-BHC (Lindane)	ug/L	0.0049	J P	U
Gamma-Chlordane	ug/L	0.098	J P D	U
Heptachlor	ug/L	0.14	D	D
Heptachlor Epoxide	ug/L	0.024	P	JN
Toxaphene	ug/L	0.49	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Herbicides

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,4,5-T	ug/L	1.9		
2,4-D	ug/L	29	D	D
2,4-DB	ug/L	4.3		J
Dinoseb	ug/L	0.91	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - VOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	U
1,1,2-Trichloroethane	ug/L	1	U	U
1,1-Dichloroethane	ug/L	1	U	U
1,1-Dichloroethene	ug/L	1	U	U
1,2,3-Trichlorobenzene	ug/L	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U
1,2-Dichlorobenzene	ug/L	0.061	J	J
1,2-Dichloroethane	ug/L	2.2		
1,2-Dichloropropane	ug/L	10		
1,3-Dichlorobenzene	ug/L	1	U	U
1,4-Dichlorobenzene	ug/L	0.11	J	J
2-Butanone	ug/L	100		
Acrolein	ug/L	20	U	U
Acrylonitrile	ug/L	20	U	U
Benzene	ug/L	2.9		
Bromodichloromethane	ug/L	1	U	U
Bromoform	ug/L	1	U	U
Bromomethane	ug/L	1	U	U
Carbon Tetrachloride	ug/L	1	J B	UB
Chlorobenzene	ug/L	7		
Chloroethane	ug/L	1.1		
Chloroform	ug/L	50	D	D
Chloromethane	ug/L	0.39	J	J
cis-1,3-Dichloropropene	ug/L	1	U	U
Dibromochloromethane	ug/L	1	U	U
Ethylbenzene	ug/L	1	U	U
Methylene Chloride	ug/L	290	D B	D
Tetrachloroethene	ug/L	0.079	J	J
Toluene	ug/L	1	J	UB
trans-1,2-Dichloroethene	ug/L	1	U	U
trans-1,3-Dichloropropene	ug/L	1	U	U
Trichloroethene	ug/L	0.039	J	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - VOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Vinyl Chloride	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - SVOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U
2,4,5-Trichlorophenol	ug/L	4.8	U	U
2,4,6-Trichlorophenol	ug/L	4.8	U	U
2,4-Dichlorophenol	ug/L	4.8	U	U
2,4-Dimethylphenol	ug/L	4.8	U	U
2,4-Dinitrophenol	ug/L	9.6	U	U
2,4-Dinitrotoluene	ug/L	4.8	U	U
2,6-Dinitrotoluene	ug/L	4.8	U	U
2-Chlorophenol	ug/L	5.6		
2-Nitrophenol	ug/L	4.8	U	U
3,3'-Dichlorobenzidine	ug/L	4.8	U	U
4,6-Dinitro-2-methylphenol	ug/L	9.6	U	U
4-Nitrophenol	ug/L	9.6	U	U
Anthracene	ug/L	4.8	U	U
Benzidine	ug/L	9.6	U	U
Benzo(a)anthracene	ug/L	4.8	U	U
Benzo(a)pyrene	ug/L	4.8	U	U
Benzo(b)fluoranthene	ug/L	4.8	U	U
Benzo(k)fluoranthene	ug/L	4.8	U	U
bis(2-Chloroethyl)ether	ug/L	4.8	U	U
bis(2-Ethylhexyl)phthalate	ug/L	0.66	J	J
Butylbenzylphthalate	ug/L	4.8	J B	UB
Chrysene	ug/L	4.8	U	U
Dibenzo(a,h)anthracene	ug/L	4.8	U	U
Diethylphthalate	ug/L	4.8	U	U
Dimethylphthalate	ug/L	4.8	U	U
Di-n-Butylphthalate	ug/L	4.8	U	U
Fluoranthene	ug/L	4.8	U	U
Fluorene	ug/L	4.8	U	U
Hexachlorobenzene	ug/L	4.8	U	U
Hexachlorobutadiene	ug/L	4.8	U	U
Hexachlorocyclopentadiene	ug/L	4.8	U	U
Hexachloroethane	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - SVOCs

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U
Isophorone	ug/L	4.8	U	U
Naphthalene	ug/L	4.8	U	U
Nitrobenzene	ug/L	4.8	U	U
N-Nitrosodimethylamine	ug/L	9.6	U	U
N-Nitrosodiphenylamine	ug/L	4.8	U	U
Pentachlorophenol	ug/L	9.6	U	U
Phenanthrene	ug/L	4.8	U	U
Phenol	ug/L	4.8	J B	UB
Pyrene	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Inorganics

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
Antimony	ug/L	7.6	E	J
Arsenic	ug/L	7.1		
Beryllium	ug/L	0.21	J	J
Cadmium	ug/L	1	U	U
Chromium	ug/L	3.9		
Copper	ug/L	3.3		
Cyanide	ug/L	2.6	J	J
Lead	ug/L	2.2		
Mercury	ug/L	0.2	U	U
Nickel	ug/L	36.5	E	J
Selenium	ug/L	12.8		J
Silver	ug/L	1	J	UB
Zinc	ug/L	109	E	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1267 - Miscellaneous

ANALYTE	Units	PRR1WATCME-36	LQ	VQ	PRR1WATCME-37	LQ	VQ
Total Organic Carbon	mg/L	NA			18	B	
Total Suspended Solids	mg/L	13.7			11		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: PJCHA08.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/04/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/08/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.6	U
108-95-2	Phenol	4.8 ~~1.2~~	~~J B~~ u8
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	5.6	
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	4.8	U
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	4.8	U
95-95-4	2,4,5-Trichlorophenol	4.8	U
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.6	U
100-02-7	4-Nitrophenol	9.6	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	4.8	U
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.6	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.6	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8	U
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.6	U
129-00-0	Pyrene	4.8	U

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: PJCHA08.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 05/04/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/07/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/08/2012

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8 ~~0.47~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	0.66	J
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	4.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.39	J
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.1	
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	290 ~~300~~	~~E~~ D
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	100	
67-66-3	Chloroform	50 ~~51~~	~~E~~ D
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0 ~~0.043~~	~~J B~~ UB
71-43-2	Benzene	2.9	
107-06-2	1,2-Dichloroethane	2.2	
79-01-6	Trichloroethene	0.039	J
78-87-5	1,2-Dichloropropane	10	
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0 ~~0.064~~	~~J~~ UB
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	0.079	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	7.0	
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	0.11	J
95-50-1	1,2-Dichlorobenzene	0.061	J
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 20.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
107-02-8	Acrolein	200	U
75-35-4	1,1-Dichloroethene	10	U
75-09-2	Methylene chloride	290	D B
107-13-1	Acrylonitrile	200	U
156-60-5	trans-1,2-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
78-93-3	2-Butanone	100	D
67-66-3	Chloroform	50	D
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	3.1	J D
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
78-87-5	1,2-Dichloropropane	12	D
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 20.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	10	U
108-90-7	Chlorobenzene	7.4	J D
100-41-4	Ethylbenzene	10	U
75-25-2	Bromoform	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
87-61-6	1,2,3-Trichlorobenzene	10	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05032012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.31	J
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.017	J B
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.015	J
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05032012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DILD21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/04/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.054	J
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.016	J
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2
Sample wt/vol: 1020 (g/mL) mL Lab File ID: 09MAY121841-R061.D
% Moisture: Decanted: (Y/N) Date Received: 05/04/2012
Extraction: (Type) SEPF Date Extracted: 05/04/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/09/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.0049	U
319-85-7	beta-BHC	0.0083 ~~0.0083~~	~~P B~~ UB
319-86-8	delta-BHC	0.0049	U
58-89-9	gamma-BHC (Lindane)	0.0049 ~~0.00081~~	~~J P~~ U
76-44-8	Heptachlor	0.14 ~~0.14~~	~~E P~~ D
309-00-2	Aldrin	0.00083	J ~~P~~
1024-57-3	Heptachlor epoxide	0.024	P JN
959-98-8	Endosulfan I	0.0049 ~~0.0026~~	~~J P~~ U
60-57-1	Dieldrin	0.0098 ~~0.00080~~	~~J P~~ U
72-55-9	4,4'-DDE	0.17	E J
72-20-8	Endrin	0.0098 ~~0.0022~~	~~J P~~ U
33213-65-9	Endosulfan II	0.0098 ~~0.0011~~	~~J P~~ U
72-54-8	4,4'-DDD	0.38 ~~0.42~~	~~E~~ D
1031-07-8	Endosulfan sulfate	0.0098 ~~0.0088~~	~~J P~~ U
50-29-3	4,4'-DDT	1.7 ~~0.49~~	~~E~~ D
7421-93-4	Endrin aldehyde	0.0098 ~~0.00066~~	~~J P B~~ UB
5103-71-9	alpha-Chlordane	0.098 ~~0.0064~~	~~P~~ U
5103-74-2	gamma-Chlordane	0.098 ~~0.0060~~	~~P~~ U
8001-35-2	Toxaphene	0.49	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2
Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10MAY120959-R031.D
% Moisture: Decanted: (Y/N) Date Received: 05/04/2012
Extraction: (Type) SEPF Date Extracted: 05/04/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/10/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 20.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.098	U
319-85-7	beta-BHC	0.012	J P D B
319-86-8	delta-BHC	0.098	U
58-89-9	gamma-BHC (Lindane)	0.098	U
76-44-8	Heptachlor	0.14	D
309-00-2	Aldrin	0.098	U
1024-57-3	Heptachlor epoxide	0.032	J P D
959-98-8	Endosulfan I	0.0077	J P D
60-57-1	Dieldrin	0.20	U
72-55-9	4,4'-DDE	0.15	J D
72-20-8	Endrin	0.20	U
33213-65-9	Endosulfan II	0.20	U
72-54-8	4,4'-DDD	0.38	D
1031-07-8	Endosulfan sulfate	0.0087	J P D
50-29-3	4,4'-DDT	1.7	D
7421-93-4	Endrin aldehyde	0.20	U
5103-71-9	alpha-Chlordane	0.0079	J P D
5103-74-2	gamma-Chlordane	0.0084	J P D
8001-35-2	Toxaphene	9.8	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10MAY121355-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/04/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/04/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/10/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.029 ~~0.027~~	~~P~~ U
789-02-6	2,4'-DDT	0.44 ~~0.32~~	~~E P~~ D
53-19-0	2,4'-DDD	0.13	P J

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267
Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2
Sample wt/vol: 1020 (g/mL) mL Lab File ID: 10MAY121355-R071.D
% Moisture: Decanted: (Y/N) Date Received: 05/04/2012
Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/04/2012
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/10/2012
Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 3.0
GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	~~0.026~~	~~J P D~~
789-02-6	2,4'-DDT	0.44	D
53-19-0	2,4'-DDD	0.13	P D

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1267

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10666-2

Sample wt/vol: 1050 (g/mL) mL Lab File ID: 08MAY121830-R041.D

% Moisture: Decanted: (Y/N) Date Received: 05/04/2012

Extraction: (Type) SEPF Date Extracted: 05/04/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/08/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.96	U
11104-28-2	Aroclor-1221	0.96	U
11141-16-5	Aroclor-1232	0.96	U
53469-21-9	Aroclor-1242	0.96	U
12672-29-6	Aroclor-1248	0.96	U
11097-69-1	Aroclor-1254	0.96	U
11096-82-5	Aroclor-1260	0.96	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Matrix: Water Lab File ID: 10may121623-r041.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 04:18

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	29 ~~29~~	~~E~~ D	1.8	0.63
88-85-7	Dinoseb	0.91	U	0.91	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	102		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Matrix: Water Lab File ID: 10may121623-r041.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 04:18

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	4.3	J	1.6	0.45
93-76-5	2,4,5-T	1.9		0.45	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	99		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 DL Lab Sample ID: 200-10666-2 DL

Matrix: Water Lab File ID: 10may121623-r031.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 03:41

Con. Extract Vol.: 10000(uL) Dilution Factor: 2

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	*2,4-D*	*29*	*D*	*3.7*	*1.3*
88-85-7	*Dinoseb*	*1.8*	*U*	*1.8*	*0.37*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	100	*D*	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG No.: PRR1267

Client Sample ID: PRR1WATCME-37 DL Lab Sample ID: 200-10666-2 DL

Matrix: Water Lab File ID: 10may121623-r031.d

Analysis Method: 8151A Date Collected: 05/03/2012 09:00

Extraction Method: 8151A Date Extracted: 05/05/2012 07:29

Sample wt/vol: 1040(mL) Date Analyzed: 05/11/2012 03:41

Con. Extract Vol.: 10000(uL) Dilution Factor: 2

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38556 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	*2,4-DB*	*4.1*	*D*	*3.3*	*0.90*
93-76-5	*2,4,5-T*	*1.8*	*D*	*0.90*	*0.25*

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	102	*D*	60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1267
Matrix: WATER Lab Sample Id: 200-10666-2
% Solids: Date Received: 05/04/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	7.6		~~E~~ J	MS
7440-38-2	Arsenic	7.1			MS
7440-41-7	Beryllium	0.21	J		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	3.9			MS
7440-50-8	Copper	3.3			MS
7439-92-1	Lead	2.2			MS
7440-02-0	Nickel	36.5		~~E~~ J	MS
7782-49-2	Selenium	12.8		J	MS
7440-22-4	Silver	1.0 ~~0.18~~	~~J~~	UB	MS
7440-66-6	Zinc	109		~~E~~ J	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1267
Matrix: WATER Lab Sample Id: 200-10666-2
% Solids: Date Received: 05/04/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-37

Lab Name: TESTAMERICA BURLINGTON
Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI
Mod. Ref. No.: SDG No.: PRR1267
Matrix: WATER
Lab Sample Id: 200-10666-2
% Solids:
Date Received: 05/04/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	2.6	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Lab Name: TestAmerica Burlington Job No.: 200-10666-2

SDG ID.: PRR1267

Matrix: Water Date Sampled: 05/03/2012 09:00

Reporting Basis: WET Date Received: 05/04/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	18.0	2.0	0.28	mg/L		B	2	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-36
Lab Sample ID: 200-10666-1
Lab Name: TestAmerica Burlington
Job No.: 200-10666-4
SDG ID.: PRR1267
Matrix: Water
Date Sampled: 04/30/2012 20:45
Reporting Basis: WET
Date Received: 05/04/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.7	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-37 Lab Sample ID: 200-10666-2

Lab Name: TestAmerica Burlington Job No.: 200-10666-4

SDG ID.: PRR1267

Matrix: Water Date Sampled: 05/03/2012 09:00

Reporting Basis: WET Date Received: 05/04/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	11.0	1.0		mg/L			1	SM 2540D

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1267	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-36	4/30/2012	20:45	water	Grab	1									X									
PRR1WATCME-37	5/3/2012	9:00	water	Grab	18	X	X	X	X	X	X	X	X	X	X								
TB05032012	5/3/2012		water	—	3		X																

Requested Analyses

1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	WET Testing
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	5/03/12	1100	[signature] TABR 5/4/12 0900			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/22/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1267 (33752)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17427R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1267 (33752) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1WATCME-37	33752-001	Water	5/3/2012				X		X

1. PCDD/PCDF by EPA Method 1613.
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in the sample PRR1WATCME-37 and confirmation analysis was performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited concentrations of PCB-11. This compound was detected in one sample at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB Congener analysis.

The method blank exhibited concentrations of PCB-11 greater than the PQL. This compound was detected in sample PRR1WATCME-37 at concentrations less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. This compound is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

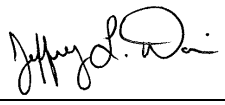
The laboratory added the qualifier “I” which is defined by the laboratory as “Chemical Interference.“ These samples results were qualified as estimated (J).

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - PCB Congeners

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
PCB-1	pg/L	53.8		
PCB-2	pg/L	35.1		
PCB-3	pg/L	19.8		
PCB-4/10	pg/L	38.2		
PCB-5/8	pg/L	168		
PCB-6	pg/L	42.5		
PCB-7/9	pg/L	90		
PCB-11	pg/L	112	B	UB
PCB-12/13	pg/L	228		
PCB-14	pg/L	109		
PCB-15	pg/L	55.6		
PCB-16/32	pg/L	67.3		
PCB-17	pg/L	44.7		
PCB-18	pg/L	123		
PCB-19	pg/L	9.42		
PCB-20/21/33	pg/L	168		
PCB-22	pg/L	73.6		
PCB-23	pg/L	28.1		
PCB-24/27	pg/L	52		
PCB-25	pg/L	16.7		
PCB-26	pg/L	35.9		
PCB-28	pg/L	223		
PCB-29	pg/L	15.8		
PCB-30	pg/L	5.08	U	U
PCB-31	pg/L	197		
PCB-34	pg/L	24.2		
PCB-35	pg/L	33.2		
PCB-36	pg/L	16.6		
PCB-37	pg/L	136		
PCB-38	pg/L	6.1		
PCB-39	pg/L	35.8		
PCB-40	pg/L	30.3		
PCB-41/64/71/72	pg/L	159		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - PCB Congeners

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
PCB-42/59	pg/L	51.3		
PCB-43/49	pg/L	139		
PCB-44	pg/L	168		
PCB-45	pg/L	26.7		
PCB-46	pg/L	11.8		
PCB-47	pg/L	66.8		
PCB-48/75	pg/L	44.3		
PCB-50	pg/L	5.08	U	U
PCB-51	pg/L	9.92		
PCB-52/69	pg/L	190		
PCB-53	pg/L	27.7		
PCB-54	pg/L	5.08	U	U
PCB-55	pg/L	5.08	U	U
PCB-56/60	pg/L	147		
PCB-57	pg/L	5.08	U	U
PCB-58	pg/L	5.08	U	U
PCB-61/70	pg/L	236		
PCB-62	pg/L	5.08	U	U
PCB-63	pg/L	18.2		
PCB-65	pg/L	5.08	U	U
PCB-67	pg/L	8.52		
PCB-68	pg/L	5.08	U	U
PCB-73	pg/L	5.08	U	U
PCB-74	pg/L	205		
PCB-76/66	pg/L	221		
PCB-77	pg/L	32.8	B	
PCB-78	pg/L	5.08	U	U
PCB-79	pg/L	14.8		
PCB-80	pg/L	5.08	U	U
PCB-81	pg/L	5.92	B	
PCB-82	pg/L	42.2		
PCB-83	pg/L	5.08	U	U
PCB-84/92	pg/L	118		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - PCB Congeners

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
PCB-85/116	pg/L	68.2		
PCB-86	pg/L	12.8		
PCB-87/117/125	pg/L	109		
PCB-88/91	pg/L	43		
PCB-89	pg/L	5.08	U	U
PCB-90/101	pg/L	299		
PCB-93	pg/L	5.08	U	U
PCB-94	pg/L	5.08	U	U
PCB-95/98/102	pg/L	202		
PCB-96	pg/L	5.08	U	U
PCB-97	pg/L	84.5		
PCB-99	pg/L	207		
PCB-100	pg/L	5.08	U	U
PCB-103	pg/L	5.08	U	U
PCB-104	pg/L	5.08	U	U
PCB-105	pg/L	137		
PCB-106/118	pg/L	458		
PCB-107/109	pg/L	35.2		
PCB-108/112	pg/L	16.3		
PCB-110	pg/L	313		
PCB-111/115	pg/L	18.2		
PCB-113	pg/L	5.08	U	U
PCB-114	pg/L	92.2		
PCB-119	pg/L	12.5		
PCB-120	pg/L	6.22		
PCB-121	pg/L	5.08	U	U
PCB-122	pg/L	5.08	U	U
PCB-123	pg/L	18.3		
PCB-124	pg/L	19.6		
PCB-126	pg/L	10.1		
PCB-127	pg/L	5.08	U	U
PCB-128/162	pg/L	77.9		
PCB-129	pg/L	32.2		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - PCB Congeners

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
PCB-130	pg/L	26.2		
PCB-131	pg/L	5.21		
PCB-132/161	pg/L	105		
PCB-133/142	pg/L	17.4		
PCB-134/143	pg/L	23.6		
PCB-135	pg/L	32.3		
PCB-136	pg/L	44.9		
PCB-137	pg/L	52.5		
PCB-138/163/164	pg/L	465		
PCB-139/149	pg/L	188		
PCB-140	pg/L	5.08	U	U
PCB-141	pg/L	159		
PCB-144	pg/L	17		
PCB-145	pg/L	5.08	U	U
PCB-146/165	pg/L	63.1		
PCB-147	pg/L	8.12		
PCB-148	pg/L	5.08	U	U
PCB-150	pg/L	5.08	U	U
PCB-151	pg/L	59.2		
PCB-152	pg/L	5.08	U	U
PCB-153	pg/L	445		
PCB-154	pg/L	15.3		
PCB-155	pg/L	7.8		
PCB-156	pg/L	236		
PCB-157	pg/L	27.5		
PCB-158/160	pg/L	78.8		
PCB-159	pg/L	5.08	U	U
PCB-166	pg/L	33.4		
PCB-167	pg/L	62.7		
PCB-168	pg/L	5.08	U	U
PCB-169	pg/L	3.22	J	J
PCB-170	pg/L	184		
PCB-171	pg/L	42.9		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - PCB Congeners

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
PCB-172	pg/L	39.8		
PCB-173	pg/L	11		
PCB-174	pg/L	158		
PCB-175	pg/L	13		
PCB-176	pg/L	21.5		
PCB-177	pg/L	79.2		
PCB-178	pg/L	40.2		
PCB-179	pg/L	72.3		
PCB-180	pg/L	485		
PCB-181	pg/L	8.18		
PCB-182/187	pg/L	224		
PCB-183	pg/L	114		
PCB-184	pg/L	6.97		
PCB-185	pg/L	47.5		
PCB-186	pg/L	5.08	U	U
PCB-188	pg/L	5.08	U	U
PCB-189	pg/L	78		
PCB-190	pg/L	166	U,I	UJ
PCB-191	pg/L	16.5		
PCB-192	pg/L	5.08	U	U
PCB-193	pg/L	17.8		
PCB-194	pg/L	275		
PCB-195	pg/L	74.9		
PCB-196/203	pg/L	347		
PCB-197	pg/L	14.3		
PCB-198	pg/L	28.8		
PCB-199	pg/L	273		
PCB-200	pg/L	30.6		
PCB-201	pg/L	34.2		
PCB-202	pg/L	87.3		
PCB-204	pg/L	5.08	U	U
PCB-205	pg/L	144	U,I	UJ
PCB-206	pg/L	778		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - PCB Congeners

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
PCB-207	pg/L	93.9		
PCB-208	pg/L	187		
PCB-209	pg/L	14400		
Total monoCB	pg/L	109		
Total diCB	pg/L	842	B	
Total triCB	pg/L	1310		
Total tetraCB	pg/L	1810	B	
Total pentaCB	pg/L	2320		
Total hexaCB	pg/L	2290		
Total heptaCB	pg/L	1660		
Total octaCB	pg/L	1170		
Total nonaCB	pg/L	1060		
Total decaCB	pg/L	14400		
Total PCB	pg/L	26900	B	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1267 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-37	LQ	VQ
2,3,7,8-TCDD	pg/L	1340		
1,2,3,7,8-PeCDD	pg/L	13	J	J
1,2,3,4,7,8-HxCDD	pg/L	7.51	J	J
1,2,3,6,7,8-HxCDD	pg/L	12.3	J	J
1,2,3,7,8,9-HxCDD	pg/L	6.18	EMPC	EMPC
1,2,3,4,6,7,8-HpCDD	pg/L	49.4		
OCDD	pg/L	2080		
Total TCDD	pg/L	1530		
Total PeCDD	pg/L	213		
Total HxCDD	pg/L	182		
Total HpCDD	pg/L	127		
2,3,7,8-TCDF	pg/L	7.67		
1,2,3,7,8-PeCDF	pg/L	25.7		
2,3,4,7,8-PeCDF	pg/L	158		
1,2,3,4,7,8-HxCDF	pg/L	1500		
1,2,3,6,7,8-HxCDF	pg/L	222		
1,2,3,7,8,9-HxCDF	pg/L	4.68	J	J
2,3,4,6,7,8-HxCDF	pg/L	97.6		
1,2,3,4,6,7,8-HpCDF	pg/L	3030		
1,2,3,4,7,8,9-HpCDF	pg/L	162		
OCDF	pg/L	9660		
Total TCDF	pg/L	553		
Total PeCDF	pg/L	1213		
Total HxCDF	pg/L	2950		
Total HpCDF	pg/L	3580		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	1620		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1WATCME-37 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33752-001	Date Received:	4-May-12
Project:	PRR1267	Sample Size:	1.04 L	QC Batch No.:	4416	Date Extracted:	4-May-12
Date Collected:	3-May-12			Date Analyzed DB-5:	8-May-12	Dates Analyzed DB-225:	7-May-12
Time Collected:	0900						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	1340			
1,2,3,7,8-PeCDD	13.0			J
1,2,3,4,7,8-HxCDD	7.51			J
1,2,3,6,7,8-HxCDD	12.3			J
1,2,3,7,8,9-HxCDD	ND		6.18	
1,2,3,4,6,7,8-HpCDD	49.4			
OCDD	2080			
2,3,7,8-TCDF	7.67			
1,2,3,7,8-PeCDF	25.7			
2,3,4,7,8-PeCDF	158			
1,2,3,4,7,8-HxCDF	1500			
1,2,3,6,7,8-HxCDF	222			
2,3,4,6,7,8-HxCDF	97.6			
1,2,3,7,8,9-HxCDF	4.68			J
1,2,3,4,6,7,8-HpCDF	3030			
1,2,3,4,7,8,9-HpCDF	162			
OCDF	9660			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	88.6	25 - 164	
	13C-1,2,3,7,8-PeCDD	81.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	82.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	78.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.7	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	79.8	23 - 140	
	13C-OCDD	74.6	17 - 157	
	13C-2,3,7,8-TCDF	83.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	81.1	24 - 185	
	13C-2,3,4,7,8-PeCDF	81.8	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	80.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	78.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	79.6	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	81.4	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	75.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	76.8	26 - 138	
	13C-OCDF	77.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	101	35 - 197	

Totals		
Total TCDD	1530	1530
Total PeCDD	213	
Total HxCDD	182	193
Total HpCDD	127	
Total TCDF	553	
Total PeCDF	1210	
Total HxCDF	2950	
Total HpCDF	3580	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 1620

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 09-May-2012 08:46

Sample ID:	PRR1WATCME-37		EPA Method 1668A
Client Data	**Sample Data**	**Laboratory Data**	
Name: ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33752-001	Date Received: 4-May-12
Project: PRR1267	Sample Size: 0.984 L	QC Batch No.: 4417	Date Extracted: 6-May-12
Date Collected: 3-May-12	%Solids: 1.04	Date Analyzed DB-1 8-May-12	
Time Collected: 0900			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	53.8	5.08	
PCB-2	35.1	5.08	
PCB-3	19.8	5.08	
PCB-4/10	38.2	10.2	
PCB-5/8	168	10.2	
PCB-6	42.5	10.2	
PCB-7/9	90.0	10.2	
PCB-11	112	10.2	~~B~~ UB
PCB-12/13	228	10.2	
PCB-14	109	10.2	
PCB-15	55.6	10.2	
PCB-16/32	67.3	5.08	
PCB-17	44.7	5.08	
PCB-18	123	5.08	
PCB-19	9.42	5.08	
PCB-20/21/33	168	5.08	
PCB-22	73.6	5.08	
PCB-23	28.1	5.08	
PCB-24/27	52.0	5.08	
PCB-25	16.7	5.08	
PCB-26	35.9	5.08	
PCB-28	223	5.08	
PCB-29	15.8	5.08	
PCB-30	ND	5.08	
PCB-31	197	5.08	
PCB-34	24.2	5.08	
PCB-35	33.2	5.08	
PCB-36	16.6	5.08	
PCB-37	136	5.08	
PCB-38	6.10	5.08	
PCB-39	35.8	5.08	
PCB-40	30.3	5.08	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	159	5.08	
PCB-42/59	51.3	5.08	
PCB-43/49	139	5.08	
PCB-44	168	5.08	
PCB-45	26.7	5.08	
PCB-46	11.8	5.08	
PCB-47	66.8	5.08	
PCB-48/75	44.3	5.08	
PCB-50	ND	5.08	
PCB-51	9.92	5.08	
PCB-52/69	190	5.08	
PCB-53	27.7	5.08	
PCB-54	ND	5.08	
PCB-55	ND	5.08	
PCB-56/60	147	5.08	
PCB-57	ND	5.08	
PCB-58	ND	5.08	
PCB-61/70	236	5.08	
PCB-62	ND	5.08	
PCB-63	18.2	5.08	
PCB-65	ND	5.08	
PCB-67	8.52	5.08	
PCB-68	ND	5.08	
PCB-73	ND	5.08	
PCB-74	205	5.08	
PCB-76/66	221	5.08	
PCB-77	32.8	5.08	~~B~~
PCB-78	ND	5.08	
PCB-79	14.8	5.08	
PCB-80	ND	5.08	
PCB-81	5.92	5.08	~~B~~
PCB-82	42.2	5.08	

Sample ID:	PRR1WATCME-37			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33752-001	Date Received: 4-May-12
Project:	PRR1267	Sample Size: 0.984 L	QC Batch No.: 4417	Date Extracted: 6-May-12
Date Collected:	3-May-12	%Solids: 1.04	Date Analyzed DB-1 8-May-12	
Time Collected:	0900			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	5.08	
PCB-84/92	118	5.08	
PCB-85/116	68.2	5.08	
PCB-86	12.8	5.08	
PCB-87/117/125	109	5.08	
PCB-88/91	43.0	5.08	
PCB-89	ND	5.08	
PCB-90/101	299	5.08	
PCB-93	ND	5.08	
PCB-94	ND	5.08	
PCB-95/98/102	202	5.08	
PCB-96	ND	5.08	
PCB-97	84.5	5.08	
PCB-99	207	5.08	
PCB-100	ND	5.08	
PCB-103	ND	5.08	
PCB-104	ND	5.08	
PCB-105	137	5.08	
PCB-106/118	458	5.08	
PCB-107/109	35.2	5.08	
PCB-108/112	16.3	5.08	
PCB-110	313	5.08	
PCB-111/115	18.2	5.08	
PCB-113	ND	5.08	
PCB-114	92.2	5.08	
PCB-119	12.5	5.08	
PCB-120	6.22	5.08	
PCB-121	ND	5.08	
PCB-122	ND	5.08	
PCB-123	18.3	5.08	
PCB-124	19.6	5.08	
PCB-126	10.1	5.08	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	5.08	
PCB-128/162	77.9	5.08	
PCB-129	32.2	5.08	
PCB-130	26.2	5.08	
PCB-131	5.21	5.08	
PCB-132/161	105	5.08	
PCB-133/142	17.4	5.08	
PCB-134/143	23.6	5.08	
PCB-135	32.3	5.08	
PCB-136	44.9	5.08	
PCB-137	52.5	5.08	
PCB-138/163/164	465	5.08	
PCB-139/149	188	5.08	
PCB-140	ND	5.08	
PCB-141	159	5.08	
PCB-144	17.0	5.08	
PCB-145	ND	5.08	
PCB-146/165	63.1	5.08	
PCB-147	8.12	5.08	
PCB-148	ND	5.08	
PCB-150	ND	5.08	
PCB-151	59.2	5.08	
PCB-152	ND	5.08	
PCB-153	445	5.08	
PCB-154	15.3	5.08	
PCB-155	7.80	5.08	
PCB-156	236	5.08	
PCB-157	27.5	5.08	
PCB-158/160	78.8	5.08	
PCB-159	ND	5.08	
PCB-166	33.4	5.08	
PCB-167	62.7	5.08	

Sample ID:	PRR1WATCME-37		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33752-001
Project:	PRR1267	Sample Size: 0.984 L	QC Batch No.: 4417
Date Collected:	3-May-12	%Solids: 1.04	Date Analyzed DB-1 8-May-12
Time Collected:	0900		Date Received: 4-May-12
			Date Extracted: 6-May-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	5.08	
PCB-169	3.22	5.08	J
PCB-170	184	5.08	
PCB-171	42.9	5.08	
PCB-172	39.8	5.08	
PCB-173	11.0	5.08	
PCB-174	158	5.08	
PCB-175	13.0	5.08	
PCB-176	21.5	5.08	
PCB-177	79.2	5.08	
PCB-178	40.2	5.08	
PCB-179	72.3	5.08	
PCB-180	485	5.08	
PCB-181	8.18	5.08	
PCB-182/187	224	5.08	
PCB-183	114	5.08	
PCB-184	6.97	5.08	
PCB-185	47.5	5.08	
PCB-186	ND	5.08	
PCB-188	ND	5.08	
PCB-189	78.0	5.08	
PCB-190	ND	166	~~J~~ J
PCB-191	16.5	5.08	
PCB-192	ND	5.08	
PCB-193	17.8	5.08	
PCB-194	275	5.08	
PCB-195	74.9	5.08	
PCB-196/203	347	5.08	
PCB-197	14.3	5.08	
PCB-198	28.8	5.08	
PCB-199	273	5.08	
PCB-200	30.6	5.08	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	34.2	5.08	
PCB-202	87.3	5.08	
PCB-204	ND	5.08	
PCB-205	ND	144	~~J~~ J
PCB-206	778	5.08	
PCB-207	93.9	5.08	
PCB-208	187	5.08	
PCB-209	14400	5.08	
Total monoCB	109	5.08	
Total diCB	842	10.2	~~B~~
Total triCB	1310	5.08	
Total tetraCB	1810	5.08	~~B~~
Total pentaCB	2320	5.08	
Total hexaCB	2290	5.08	
Total heptaCB	1660	5.08	
Total octaCB	1170	5.08	
Total nonaCB	1060	5.08	
Total decaCB	14400	5.08	
Total PCB	26900	10.2	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: 1.14

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33752 4.6°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1267	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-37	5/3/2012	9:00	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins (17 isomers) and Total PCDD/PCDFs
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[illegible]	5/3/12	1100	Bethnie Benedict			
Relinquished by:	DATE	TIME	Received by: 5/4/12 0854	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1273 (200-10697)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17470R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1273 (200-10697) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-18-SP-105	200-10697-1	Water	5/4/2012		X				
PRR1WATGACE-18-SP-106	200-10697-2	Water	5/4/2012		X				
PRR1WATGACE-18-SP-109	200-10697-3	Water	5/4/2012		X				
PRR1WATCME-38	200-10697-4	Water	5/4/2012						X
PRR1WAT-18-SP-100	200-10697-5	Water	5/4/2012						X
TB05042012	200-10697-6	Water	5/4/2012		X				
PRR1WATCME-39	200-10697-7	Water	5/5/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-18-SP-105	Chlorobenzene	34000 E	32000 D	32000 D
PRR1WATGACE-18-SP-106	Chlorobenzene	52 E	60 D	60 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 10, 2012

PEER REVIEW: Dennis Capria

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1273 - VOCs

ANALYTE	Units	PRR1WATGACE-18-SP-106	LQ	VQ	PRR1WATGACE-18-SP-109	LQ	VQ	PRR1WATGACI-18	LQ	VQ
2-Butanone	ug/L	280			280			300	J	J
Chlorobenzene	ug/L	60	D	D	290			32000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1273 - Miscellaneous

ANALYTE	Units	PRR1WAT-18	LQ	VQ	PRR1WATCME-38	LQ	VQ	PRR1WATCME-39	LQ	VQ
Total Suspended Solids	mg/L	34.7			10.2			15.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-18-SP-1

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDI14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	280	
108-90-7	Chlorobenzene	60 ~~52~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-18-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIA06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/08/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	310	D
108-90-7	Chlorobenzene	60	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-18-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIA07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/08/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 24.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	280	
108-90-7	Chlorobenzene	290	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-18-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDI12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 275.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	300	J
108-90-7	Chlorobenzene	32000 ~~34000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-18-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDI11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2000.0

Soil Extract Volume: (ul) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10000	U
108-90-7	Chlorobenzene	32000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05042012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIA08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/08/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.33	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-38 Lab Sample ID: 200-10697-4

Lab Name: TestAmerica Burlington Job No.: 200-10697-2

SDG ID.: PRR1273

Matrix: Water Date Sampled: 05/04/2012 08:55

Reporting Basis: WET Date Received: 05/07/2012 07:49

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.2	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-18-SP-100 Lab Sample ID: 200-10697-5

Lab Name: TestAmerica Burlington Job No.: 200-10697-2

SDG ID.: PRR1273

Matrix: Water Date Sampled: 05/04/2012 09:15

Reporting Basis: WET Date Received: 05/07/2012 07:49

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	34.7	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-39 Lab Sample ID: 200-10697-7

Lab Name: TestAmerica Burlington Job No.: 200-10697-2

SDG ID.: PRR1273

Matrix: Water Date Sampled: 05/05/2012 06:35

Reporting Basis: WET Date Received: 05/07/2012 07:49

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.2	1.9		mg/L			1	SM 2540D

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1273	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-18-SP-105	5/4/2012	9:10	water	Grab	3	X																	
PRR1WATGACE-18-SP-106	5/4/2012	9:05	water	Grab	3	X																	
PRR1WATGACE-18-SP-109	5/4/2012	9:00	water	Grab	3	X																	
PRR1WATCME-38	5/4/2012	8:55	water	Grab	1		X																
PRR1WAT-18-SP-100	5/4/2012	9:15	water	Grab	1		X																
TB05042012	5/4/2012		water	Grab	3	X																	
PRR1WATCME-39	5/5/2012	6:35	water	Grab	1		X																

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.0°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Mark Hotter	5/4/12	09:30				
	5/5/12	0730	5/7/12 0749			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1273 (200-10697)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17470R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1273 (200-10697) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-18-SP-105	200-10697-1	Water	5/4/2012		X				
PRR1WATGACE-18-SP-106	200-10697-2	Water	5/4/2012		X				
PRR1WATGACE-18-SP-109	200-10697-3	Water	5/4/2012		X				
PRR1WATCME-38	200-10697-4	Water	5/4/2012						X
PRR1WAT-18-SP-100	200-10697-5	Water	5/4/2012						X
TB05042012	200-10697-6	Water	5/4/2012		X				
PRR1WATCME-39	200-10697-7	Water	5/5/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-18-SP-105	Chlorobenzene	34000 E	32000 D	32000 D
PRR1WATGACE-18-SP-106	Chlorobenzene	52 E	60 D	60 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 10, 2012

PEER REVIEW: Dennis Capria

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1273 - VOCs

ANALYTE	Units	PRR1WATGACE-18-SP-106	LQ	VQ	PRR1WATGACE-18-SP-109	LQ	VQ	PRR1WATGACI-18	LQ	VQ
2-Butanone	ug/L	280			280			300	J	J
Chlorobenzene	ug/L	60	D	D	290			32000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1273 - Miscellaneous

ANALYTE	Units	PRR1WAT-18	LQ	VQ	PRR1WATCME-38	LQ	VQ	PRR1WATCME-39	LQ	VQ
Total Suspended Solids	mg/L	34.7			10.2			15.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-18-SP-1

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDI14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	280	
108-90-7	Chlorobenzene	60 ~~52~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-18-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIA06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/08/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	310	D
108-90-7	Chlorobenzene	60	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-18-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIA07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/08/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 24.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	280	
108-90-7	Chlorobenzene	290	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-18-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDI12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 275.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	300	J
108-90-7	Chlorobenzene	32000 ~~34000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-18-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDI11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2000.0

Soil Extract Volume: (ul) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	10000	U
108-90-7	Chlorobenzene	32000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05042012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1273

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10697-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIA08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/07/2012

% Moisture: not dec. Date Analyzed: 05/08/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.33	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-38 Lab Sample ID: 200-10697-4

Lab Name: TestAmerica Burlington Job No.: 200-10697-2

SDG ID.: PRR1273

Matrix: Water Date Sampled: 05/04/2012 08:55

Reporting Basis: WET Date Received: 05/07/2012 07:49

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.2	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-18-SP-100 Lab Sample ID: 200-10697-5

Lab Name: TestAmerica Burlington Job No.: 200-10697-2

SDG ID.: PRR1273

Matrix: Water Date Sampled: 05/04/2012 09:15

Reporting Basis: WET Date Received: 05/07/2012 07:49

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	34.7	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-39 Lab Sample ID: 200-10697-7

Lab Name: TestAmerica Burlington Job No.: 200-10697-2

SDG ID.: PRR1273

Matrix: Water Date Sampled: 05/05/2012 06:35

Reporting Basis: WET Date Received: 05/07/2012 07:49

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.2	1.9		mg/L			1	SM 2540D

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1273	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-18-SP-105	5/4/2012	9:10	water	Grab	3	X																	
PRR1WATGACE-18-SP-106	5/4/2012	9:05	water	Grab	3	X																	
PRR1WATGACE-18-SP-109	5/4/2012	9:00	water	Grab	3	X																	
PRR1WATCME-38	5/4/2012	8:55	water	Grab	1		X																
PRR1WAT-18-SP-100	5/4/2012	9:15	water	Grab	1		X																
TB05042012	5/4/2012		water	Grab	3	X																	
PRR1WATCME-39	5/5/2012	6:35	water	Grab	1		X																

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 2.0°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Mark Hotter	5/4/12	09:30				
	5/5/12	0730	5/7/12 0749			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1276 (200-10728)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17473R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1276 (200-10728) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-19-SP-105	200-10728-1	Water	5/8/2012		X				
PRR1WATGACE-19-SP-106	200-10728-2	Water	5/8/2012		X				
PRR1WATGACE-19-SP-109	200-10728-3	Water	5/8/2012		X				
PRR1WATCME-41	200-10728-4	Water	5/8/2012						X
PRR1WAT-19-SP-101	200-10728-5	Water	5/8/2012						X
TB05082012	200-10728-6	Water	5/8/2012		X				
PRR1WATCME-40	200-10728-7	Water	5/7/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1WATGACE-19-SP-109 was used in the MS/MSD analysis. The MS/MSD analysis exhibited acceptable recoveries and RPDs between the MS and MSD results

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-19-SP-105	Chlorobenzene	5000 E	4500 D	4500 D
PRR1WATGACE-19-SP-106	Chlorobenzene	730 E	510 D	510 D
PRR1WATGACE-19-SP-109	Chlorobenzene	45 E	44 D	44 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 < calibration range	DJ

Reported Sample Results	Qualification
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference (RPD) between the sample and its duplicate may be used to qualify data.

Sample location PRR1WATCME-41 was used in the laboratory duplicate sample analysis. The laboratory duplicate sample results exhibited a RPD within the control limit.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1276 - VOCs

ANALYTE	Units	PRR1WATGACE-19-SP-106	LQ	VQ	PRR1WATGACE-19-SP-109	LQ	VQ	PRR1WATGACI-19-SP-105	LQ	VQ
2-Butanone	ug/L	210			160			180 J		J
Chlorobenzene	ug/L	510 D		D	44 D		D	4500 D		D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1276 - Miscellaneous

ANALYTE	Units	PRR1WAT-19-SP-101	LQ	VQ	PRR1WATCME-40	LQ	VQ	PRR1WATCME-41	LQ	VQ
Total Suspended Solids	mg/L	25.7			5.5			7.1		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 5.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	210	
108-90-7	Chlorobenzene	5 10 ~~730~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	170	J D
108-90-7	Chlorobenzene	510	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	160	
108-90-7	Chlorobenzene	44 ~~45~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	D
108-90-7	Chlorobenzene	44	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-19-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	180	J
108-90-7	Chlorobenzene	4500 ~~5000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-19-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 275.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	210	J D
108-90-7	Chlorobenzene	4500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05082012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-41 Lab Sample ID: 200-10728-4

Lab Name: TestAmerica Burlington Job No.: 200-10728-2

SDG ID.: PRR1276

Matrix: Water Date Sampled: 05/08/2012 09:25

Reporting Basis: WET Date Received: 05/09/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.1	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-19-SP-101 Lab Sample ID: 200-10728-5

Lab Name: TestAmerica Burlington Job No.: 200-10728-2

SDG ID.: PRR1276

Matrix: Water Date Sampled: 05/08/2012 09:48

Reporting Basis: WET Date Received: 05/09/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	25.7	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-40 Lab Sample ID: 200-10728-7

Lab Name: TestAmerica Burlington Job No.: 200-10728-2

SDG ID.: PRR1276

Matrix: Water Date Sampled: 05/07/2012 13:35

Reporting Basis: WET Date Received: 05/09/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.5	2.0		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1276	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-19-SP-105	5/8/2012	9:40	water	Grab	3	X																	
PRR1WATGACE-19-SP-106	5/8/2012	9:35	water	Grab	3	X																	
PRR1WATGACE-19-SP-109	5/8/2012	9:28	water	Grab	9	X																	
PRR1WATCME-41	5/8/2012	9:25	water	Grab	2		X																
PRR1WAT-19-SP-101	5/8/2012	9:48	water	Grab	1		X																
TB05082012	5/8/2012		water	Grab	3	X																	
PRR1WATCME-40	5/7/2012	13:35	water	Grab	1		X																

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Triple volume collected for MS/MSD at PRR1WATGACE-19-SP-109

Double volume collected for TSS lab replicate at PRR1WATCME-41

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Lisa Bruney	5/8/12	1345				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	5/8/12	1430	5/9/12 0830			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/10/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1276 (200-10728)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17473R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1276 (200-10728) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-19-SP-105	200-10728-1	Water	5/8/2012		X				
PRR1WATGACE-19-SP-106	200-10728-2	Water	5/8/2012		X				
PRR1WATGACE-19-SP-109	200-10728-3	Water	5/8/2012		X				
PRR1WATCME-41	200-10728-4	Water	5/8/2012						X
PRR1WAT-19-SP-101	200-10728-5	Water	5/8/2012						X
TB05082012	200-10728-6	Water	5/8/2012		X				
PRR1WATCME-40	200-10728-7	Water	5/7/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1WATGACE-19-SP-109 was used in the MS/MSD analysis. The MS/MSD analysis exhibited acceptable recoveries and RPDs between the MS and MSD results

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-19-SP-105	Chlorobenzene	5000 E	4500 D	4500 D
PRR1WATGACE-19-SP-106	Chlorobenzene	730 E	510 D	510 D
PRR1WATGACE-19-SP-109	Chlorobenzene	45 E	44 D	44 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 < calibration range	DJ

Reported Sample Results	Qualification
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference (RPD) between the sample and its duplicate may be used to qualify data.

Sample location PRR1WATCME-41 was used in the laboratory duplicate sample analysis. The laboratory duplicate sample results exhibited a RPD within the control limit.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1276 - VOCs

ANALYTE	Units	PRR1WATGACE-19-SP-106	LQ	VQ	PRR1WATGACE-19-SP-109	LQ	VQ	PRR1WATGACI-19-SP-105	LQ	VQ
2-Butanone	ug/L	210			160			180 J		J
Chlorobenzene	ug/L	510 D		D	44 D		D	4500 D		D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1276 - Miscellaneous

ANALYTE	Units	PRR1WAT-19-SP-101	LQ	VQ	PRR1WATCME-40	LQ	VQ	PRR1WATCME-41	LQ	VQ
Total Suspended Solids	mg/L	25.7			5.5			7.1		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 5.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	210	
108-90-7	Chlorobenzene	5 10 ~~730~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	170	J D
108-90-7	Chlorobenzene	510	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	160	
108-90-7	Chlorobenzene	44 ~~45~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-19-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	140	D
108-90-7	Chlorobenzene	44	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-19-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	180	J
108-90-7	Chlorobenzene	4500 ~~5000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-19-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 275.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	210	J D
108-90-7	Chlorobenzene	4500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05082012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1276

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10728-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDIC18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/09/2012

% Moisture: not dec. Date Analyzed: 05/09/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-41 Lab Sample ID: 200-10728-4

Lab Name: TestAmerica Burlington Job No.: 200-10728-2

SDG ID.: PRR1276

Matrix: Water Date Sampled: 05/08/2012 09:25

Reporting Basis: WET Date Received: 05/09/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.1	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-19-SP-101 Lab Sample ID: 200-10728-5

Lab Name: TestAmerica Burlington Job No.: 200-10728-2

SDG ID.: PRR1276

Matrix: Water Date Sampled: 05/08/2012 09:48

Reporting Basis: WET Date Received: 05/09/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	25.7	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-40 Lab Sample ID: 200-10728-7

Lab Name: TestAmerica Burlington Job No.: 200-10728-2

SDG ID.: PRR1276

Matrix: Water Date Sampled: 05/07/2012 13:35

Reporting Basis: WET Date Received: 05/09/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.5	2.0		mg/L			1	SM 2540D

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Infrastructure, environment, buildings
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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1276	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-19-SP-105	5/8/2012	9:40	water	Grab	3	X																	
PRR1WATGACE-19-SP-106	5/8/2012	9:35	water	Grab	3	X																	
PRR1WATGACE-19-SP-109	5/8/2012	9:28	water	Grab	9	X																	
PRR1WATCME-41	5/8/2012	9:25	water	Grab	2		X																
PRR1WAT-19-SP-101	5/8/2012	9:48	water	Grab	1		X																
TB05082012	5/8/2012		water	Grab	3	X																	
PRR1WATCME-40	5/7/2012	13:35	water	Grab	1		X																

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Triple volume collected for MS/MSD at PRR1WATGACE-19-SP-109

Double volume collected for TSS lab replicate at PRR1WATCME-41

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Lisa Bruney	5/8/12	1345				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	5/8/12	1430	5/9/12 0830			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/10/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1278 (200-10748)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17475R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1278 (200-10748) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-42	200-10748-1	Water	5/9/2012		X	X	X	X	X
TB05092012	200-10748-2	Water	5/9/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. SVOC – Semivolatile Organic Compounds by USEPA Method SOM0.1.2
3. PEST/PCB – Pesticides and PCBs by USEPA Method SOM01.2, and Chlorinated Herbicides by USEPA SW846 Method 8151A
4. MET - Metals by USEPA Method ISM01.2
5. MISC – Total Suspended Solids (TSS) by Standard Methods (SM) 2540D, Total Organic Carbon (TOC) by SM 5310B, and Cyanide by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank or field blank at or above the project quantitation limits (PQL) or the method detection limits (MDL) during volatiles analysis. Therefore detected sample results were not associated with blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) or the method detection limits (MDL) during SVOC analysis. Therefore detected sample results were not associated with blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

Several detected pesticides exhibited results that exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during pesticides analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. 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 Location	Analyte	Sample Result	Qualification
PRR1WATCME-42	alpha-BHC beta-BHC	Detected sample results < RL and < BAL	“UB” at the RL

RL Reporting limit

3. SURROGATES

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.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does contain a dilution analysis due to elevated target compounds associated with the original analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCME-42	4,4'-DDT	0.27 E	0.26 D	0.26 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

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 Location	Compound	%D
PRR1WATCME-42	2,4'-DDE	526.7 %
	2,4'-DDD	26.9 %
	delta-BHC	969.7 %
	gamma-BHC	49.3 %
	Heptachlor	999.9 %
	Heptachlor epoxide	116.5%
	Dieldrin	64.3 %
	Endrin	897.6 %
	Endosulfan I	999.9 %
	Endosulfan II	999.9 %
	Endosulfan sulfate	140.5 %
	Endrin aldehyde	999.9 %
	alpha-Chlordane	999.9 %
	gamma-Chlordane	63.3 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blanks or field blank at or above the PQL during PCB analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during herbicides analysis. 2,4,5-T was detected at less than the PQL in the method blank; however, 2,4,5-T was not detected in the associated sample. Therefore, no qualification is required.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a

given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The nickel result for sample location PRR1WATCME-42 was qualified as estimated due to serial dilution percent difference exceedance. The nickel result may have a low bias.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during metals analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results associated with QA blank contamination that were greater than the BAL did not require qualification. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1WATCME-42	Chromium Silver	Detected sample results < RL and < BAL	"UB" at the RL
	Lead	Detected sample results > RL and < BAL	"UB" at detected sample concentration

RL = reporting limit

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. All LCS recoveries were within the control limits, with the exception of the analytes associated with sample locations, as presented in the following table.

Sample Location	Analyte	LCS Recovery
PRR1WATCME-42	Antimony	125%
	Cadmium	121%
	Lead	127%
	Silver	126%
	Zinc	142%

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

Control limit	Sample Result	Qualification
LCS percent recovery 50% to 79%	Non-detect	UJ
	Detect	J
LCS percent recovery < 50%	Non-detect	R
	Detect	J
LCS percent recovery > 120%	Non-detect	No Action
	Detect	J

4. MATRIX SPIKE (MS)

The MS analysis is performed to determine the accuracy of the analytical procedure in a given matrix.

Sample location PRR1WATCME-42 was used in the MS/MSD analysis. The MS analysis exhibited recoveries within the control limits.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data. A control limit of 20% for water matrices and 35% for soil matrices is applied to concentrations that are at least five times the reporting limit (RL). 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.

Sample location PRR1WATCME-424 was used in the laboratory duplicate sample analysis. All analytes associated with laboratory duplicate sample RPDs were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory RPD
PRR1WATCME-42	Selenium	62%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate sample RPD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with this analytical batch.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and laboratory sample concentration > 5x RL	Water: 20% Soil: 35%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result ≤ 5x the RL and difference between samples > RL	Water: 1x RL Soil: 2x RL	Non-detect	UJ
		Detect	J

6. 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.

Sample location PRR1WATCME-42 was used in the serial dilution analysis. All serial dilutions were within the control limits, with the exception of the analyte presented in the following table. The nickel result for the diluted sample was greater than the nickel result for the undiluted sample.

Sample Location	Analyte	Serial Dilution (%D)
PRR1WATCME-42	Antimony	17 %
	Selenium	45 %

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. The qualifications are applied to all sample results associated with this analytical batch.

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

7. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

11. Overall Assessment

Overall 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.

CYANIDE, TSS, AND TOC DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. Analytes were detected in the associated QA blanks; however, the associated sample results were greater than the BAL 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCS analyses were performed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.

Qualifier	Description
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 11, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - PCBs

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
Aroclor-1016	ug/L	0.97	U	U
Aroclor-1221	ug/L	0.97	U	U
Aroclor-1232	ug/L	0.97	U	U
Aroclor-1242	ug/L	0.97	U	U
Aroclor-1248	ug/L	0.97	U	U
Aroclor-1254	ug/L	0.97	U	U
Aroclor-1260	ug/L	0.97	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - Pesticides

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
2,4'-DDD	ug/L	0.024	P	J
2,4'-DDE	ug/L	0.0098	J P	U
2,4'-DDT	ug/L	0.061		
4,4'-DDD	ug/L	0.056	B	
4,4'-DDE	ug/L	0.023		
4,4'-DDT	ug/L	0.26	D B	D
Aldrin	ug/L	0.0049	U	U
Alpha-BHC	ug/L	0.0049	J P B	UB
Alpha-Chlordane	ug/L	0.0049	J P	U
Beta-BHC	ug/L	0.0049	J P B	UB
Delta-BHC	ug/L	0.018	P B	JN
Dieldrin	ug/L	0.0098	J P	U
Endosulfan I	ug/L	0.0049	J P	U
Endosulfan II	ug/L	0.0098	J P	U
Endosulfan Sulfate	ug/L	0.0098	J P	U
Endrin	ug/L	0.0098	J P	U
Endrin Aldehyde	ug/L	0.0098	J P	U
Gamma-BHC (Lindane)	ug/L	0.00013	J P	J
Gamma-Chlordane	ug/L	0.0049	J P	U
Heptachlor	ug/L	0.0049	J P B	U
Heptachlor Epoxide	ug/L	0.0049	J P	U
Toxaphene	ug/L	0.49	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - Herbicides

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
2,4,5-T	ug/L	0.46	U	U
2,4-D	ug/L	1.9	U	U
2,4-DB	ug/L	1.7	U	U
Dinoseb	ug/L	0.93	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - VOCs

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	U
1,1,2-Trichloroethane	ug/L	1	U	U
1,1-Dichloroethane	ug/L	1	U	U
1,1-Dichloroethene	ug/L	1	U	U
1,2,3-Trichlorobenzene	ug/L	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U
1,2-Dichlorobenzene	ug/L	1	U	U
1,2-Dichloroethane	ug/L	1	U	U
1,2-Dichloropropane	ug/L	1	U	U
1,3-Dichlorobenzene	ug/L	1	U	U
1,4-Dichlorobenzene	ug/L	1	U	U
2-Butanone	ug/L	10	U	U
Acrolein	ug/L	20	U	U
Acrylonitrile	ug/L	20	U	U
Benzene	ug/L	1	U	U
Bromodichloromethane	ug/L	1	U	U
Bromoform	ug/L	1	U	U
Bromomethane	ug/L	1	U	U
Carbon Tetrachloride	ug/L	1	U	U
Chlorobenzene	ug/L	0.15	J	J
Chloroethane	ug/L	1	U	U
Chloroform	ug/L	1	U	U
Chloromethane	ug/L	0.39	J	J
cis-1,3-Dichloropropene	ug/L	1	U	U
Dibromochloromethane	ug/L	1	U	U
Ethylbenzene	ug/L	1	U	U
Methylene Chloride	ug/L	0.45	J	J
Tetrachloroethene	ug/L	1	U	U
Toluene	ug/L	1	U	U
trans-1,2-Dichloroethene	ug/L	1	U	U
trans-1,3-Dichloropropene	ug/L	1	U	U
Trichloroethene	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - VOCs

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
Vinyl Chloride	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - SVOCs

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.8	U	U
2,4,5-Trichlorophenol	ug/L	4.8	U	U
2,4,6-Trichlorophenol	ug/L	4.8	U	U
2,4-Dichlorophenol	ug/L	4.8	U	U
2,4-Dimethylphenol	ug/L	4.8	U	U
2,4-Dinitrophenol	ug/L	9.7	U	U
2,4-Dinitrotoluene	ug/L	4.8	U	U
2,6-Dinitrotoluene	ug/L	4.8	U	U
2-Chlorophenol	ug/L	4.8	U	U
2-Nitrophenol	ug/L	4.8	U	U
3,3'-Dichlorobenzidine	ug/L	4.8	U	U
4,6-Dinitro-2-methylphenol	ug/L	9.7	U	U
4-Nitrophenol	ug/L	9.7	U	U
Anthracene	ug/L	4.8	U	U
Benzidine	ug/L	9.7	U	U
Benzo(a)anthracene	ug/L	4.8	U	U
Benzo(a)pyrene	ug/L	0.09	J	J
Benzo(b)fluoranthene	ug/L	4.8	U	U
Benzo(k)fluoranthene	ug/L	4.8	U	U
bis(2-Chloroethyl)ether	ug/L	4.8	U	U
bis(2-Ethylhexyl)phthalate	ug/L	4.8	U	U
Butylbenzylphthalate	ug/L	4.8	U	U
Chrysene	ug/L	4.8	U	U
Dibenzo(a,h)anthracene	ug/L	4.8	U	U
Diethylphthalate	ug/L	4.8	U	U
Dimethylphthalate	ug/L	4.8	U	U
Di-n-Butylphthalate	ug/L	4.8	U	U
Fluoranthene	ug/L	4.8	U	U
Fluorene	ug/L	4.8	U	U
Hexachlorobenzene	ug/L	4.8	U	U
Hexachlorobutadiene	ug/L	4.8	U	U
Hexachlorocyclopentadiene	ug/L	4.8	U	U
Hexachloroethane	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - SVOCs

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.8	U	U
Isophorone	ug/L	4.8	U	U
Naphthalene	ug/L	4.8	U	U
Nitrobenzene	ug/L	4.8	U	U
N-Nitrosodimethylamine	ug/L	9.7	U	U
N-Nitrosodiphenylamine	ug/L	4.8	U	U
Pentachlorophenol	ug/L	9.7	U	U
Phenanthrene	ug/L	4.8	U	U
Phenol	ug/L	4.8	U	U
Pyrene	ug/L	4.8	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - Inorganics

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
Antimony	ug/L	13	E	J
Arsenic	ug/L	5.8		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2	J	UB
Copper	ug/L	5.9		
Cyanide	ug/L	1.7	J	J
Lead	ug/L	1.1		UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	13.7		
Selenium	ug/L	10.7	E *	J
Silver	ug/L	1	J	UB
Zinc	ug/L	17.5		J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1278 - Miscellaneous

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
Total Organic Carbon	mg/L	5.7	B	
Total Suspended Solids	mg/L	5.1		

SAMPLE ANALYSIS DATA SHEETS AND COCs

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON | Contract: LPRSA
Lab Code: TABVT | Case No.: RAPHASI | Mod. Ref. No.: | SDG No.: PRR1278
Matrix: WATER | Lab Sample Id: 200-10748-1
% Solids: | Date Received: 05/10/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	13.0		~~B~~ J	MS
7440-38-2	Arsenic	5.8			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2.0 ~~1.2~~	~~J~~	UB	MS
7440-50-8	Copper	5.9			MS
7439-92-1	Lead	1.1		UB	MS
7440-02-0	Nickel	13.7			MS
7782-49-2	Selenium	10.7		~~E~~ J	MS
7440-22-4	Silver	1.0 ~~0.074~~	~~J~~	UB	MS
7440-66-6	Zinc	17.5		J	MS

Color Before: COLORLESS | Clarity Before: CLEAR | Texture:
Color After: COLORLESS | Clarity After: CLEAR | Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1278
Matrix: WATER Lab Sample Id: 200-10748-1
% Solids: Date Received: 05/10/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1278
Matrix: WATER Lab Sample Id: 200-10748-1
% Solids: Date Received: 05/10/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	1.7	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/10/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.39	J
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	0.45	J
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/10/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	0.15	J
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05092012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/10/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.50	U
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05092012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/10/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 1040 (g/mL) mL Lab File ID: PJCIA11.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/10/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/10/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/16/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.7	U
108-95-2	Phenol	4.8	U
111-44-4	Bis(2-chloroethyl)ether	4.8	U
95-57-8	2-Chlorophenol	4.8	U
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8	U
67-72-1	Hexachloroethane	4.8	U
98-95-3	Nitrobenzene	4.8	U
78-59-1	Isophorone	4.8	U
88-75-5	2-Nitrophenol	4.8	U
105-67-9	2,4-Dimethylphenol	4.8	U
120-83-2	2,4-Dichlorophenol	4.8	U
91-20-3	Naphthalene	4.8	U
87-68-3	Hexachlorobutadiene	4.8	U
77-47-4	Hexachlorocyclopentadiene	4.8	U
88-06-2	2,4,6-Trichlorophenol	4.8	U
95-95-4	2,4,5-Trichlorophenol	4.8	U
131-11-3	Dimethylphthalate	4.8	U
606-20-2	2,6-Dinitrotoluene	4.8	U
51-28-5	2,4-Dinitrophenol	9.7	U
100-02-7	4-Nitrophenol	9.7	U
121-14-2	2,4-Dinitrotoluene	4.8	U
84-66-2	Diethylphthalate	4.8	U
86-73-7	Fluorene	4.8	U
534-52-1	4,6-Dinitro-2-methylphenol	9.7	U
86-30-6	N-Nitrosodiphenylamin [1]	4.8	U
118-74-1	Hexachlorobenzene	4.8	U
87-86-5	Pentachlorophenol	9.7	U
85-01-8	Phenanthrene	4.8	U
120-12-7	Anthracene	4.8	U
84-74-2	Di-n-butylphthalate	4.8	U
206-44-0	Fluoranthene	4.8	U
92-87-5	Benzidine	9.7	U
129-00-0	Pyrene	4.8	U

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 1040 (g/mL) mL Lab File ID: PJCIA11.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/10/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/10/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/16/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.8	U
91-94-1	3,3'-Dichlorobenzidine	4.8	U
56-55-3	Benzo(a)anthracene	4.8	U
218-01-9	Chrysene	4.8	U
117-81-7	Bis(2-ethylhexyl)phthalate	4.8	U
205-99-2	Benzo(b)fluoranthene	4.8	U
207-08-9	Benzo(k)fluoranthene	4.8	U
50-32-8	Benzo(a)pyrene	0.090	J
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	U
53-70-3	Dibenzo(a,h)anthracene	4.8	U

[1]Cannot be separated from Diphenylamine

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 11MAY122104-R111.D

% Moisture: Decanted: (Y/N) Date Received: 05/10/2012

Extraction: (Type) SEPF Date Extracted: 05/10/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/12/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.0049	~~0.00040~~	~~J P B~~ UB
319-85-7	beta-BHC	0.0049	~~0.0033~~	~~J P B~~ UB
319-86-8	delta-BHC		0.018	~~P B~~ JN
58-89-9	gamma-BHC (Lindane)		0.00013	~~J P~~
76-44-8	Heptachlor	0.0049	~~0.00022~~	~~J P B~~ U
309-00-2	Aldrin		0.0049	U
1024-57-3	Heptachlor epoxide	0.0049	~~0.0045~~	~~J P~~ U
959-98-8	Endosulfan I	0.0049	~~0.0014~~	~~J P~~ U
60-57-1	Dieldrin	0.0098	~~0.00031~~	~~J P~~ U
72-55-9	4,4'-DDE		0.023	
72-20-8	Endrin	0.0098	~~0.00012~~	~~J P~~ U
33213-65-9	Endosulfan II	0.0098	~~0.00019~~	~~J P~~ U
72-54-8	4,4'-DDD		0.056	~~B~~
1031-07-8	Endosulfan sulfate	0.0098	~~0.0014~~	~~J P~~ U
50-29-3	4,4'-DDT		0.26 ~~0.27~~	~~E B~~ D
7421-93-4	Endrin aldehyde	0.0098	~~0.00046~~	~~J P~~ U
5103-71-9	alpha-Chlordane	0.0049	~~0.0014~~	~~J P~~ U
5103-74-2	gamma-Chlordane	0.0049	~~0.0018~~	~~J P~~ U
8001-35-2	Toxaphene		0.49	U

EPA SAMPLE NO.
PRR1WATCME-42DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 11MAY122104-R101.D

% Moisture: Decanted: (Y/N) Date Received: 05/10/2012

Extraction: (Type) SEPF Date Extracted: 05/10/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/12/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.00038	J D B
319-85-7	beta-BHC	0.0023	J P D B
319-86-8	delta-BHC	0.018	P D B
58-89-9	gamma-BHC (Lindane)	0.00016	J P D
76-44-8	Heptachlor	0.00012	J P D B
309-00-2	Aldrin	0.015	U
1024-57-3	Heptachlor epoxide	0.0046	J P D
959-98-8	Endosulfan I	0.0011	J P D
60-57-1	Dieldrin	0.029	U
72-55-9	4,4'-DDE	0.023	J D
72-20-8	Endrin	0.00014	J P D
33213-65-9	Endosulfan II	0.00018	J P D
72-54-8	4,4'-DDD	0.052	D B
1031-07-8	Endosulfan sulfate	0.0013	J P D
50-29-3	4,4'-DDT	0.26	D B
7421-93-4	Endrin aldehyde	0.00021	J P D
5103-71-9	alpha-Chlordane	0.0014	J P D
5103-74-2	gamma-Chlordane	0.0017	J P D
8001-35-2	Toxaphene	1.5	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: 15MAY121554-R031.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 05/10/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/10/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/15/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.0098 ~~0.0024~~	~~J P~~ U
789-02-6	2,4'-DDT	0.061	
53-19-0	2,4'-DDD	0.024	~~P~~ J

EPA SAMPLE NO.
PRR1WATCME-42

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1278

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10748-1

Sample wt/vol: 1030 (g/mL) mL Lab File ID: 11MAY122204-R031.D

% Moisture: Decanted: (Y/N) Date Received: 05/10/2012

Extraction: (Type) SEPF Date Extracted: 05/10/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/12/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	0.97	U
11104-28-2	Aroclor-1221	0.97	U
11141-16-5	Aroclor-1232	0.97	U
53469-21-9	Aroclor-1242	0.97	U
12672-29-6	Aroclor-1248	0.97	U
11097-69-1	Aroclor-1254	0.97	U
11096-82-5	Aroclor-1260	0.97	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10748-2

SDG No.: PRR1278

Client Sample ID: PRR1WATCME-42 Lab Sample ID: 200-10748-1

Matrix: Water Lab File ID: 16may121620-r061.d

Analysis Method: 8151A Date Collected: 05/09/2012 12:00

Extraction Method: 8151A Date Extracted: 05/10/2012 13:41

Sample wt/vol: 1025(mL) Date Analyzed: 05/16/2012 19:51

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38834 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.9	U	1.9	0.63
94-82-6	2,4-DB	1.7	U	1.7	0.46
88-85-7	Dinoseb	0.93	U	0.93	0.19
93-76-5	2,4,5-T	0.46	U	0.46	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	87		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10748-2

SDG No.: PRR1278

Client Sample ID: PRR1WATCME-42 Lab Sample ID: 200-10748-1

Matrix: Water Lab File ID: 16may121620-r061.d

Analysis Method: 8151A Date Collected: 05/09/2012 12:00

Extraction Method: 8151A Date Extracted: 05/10/2012 13:41

Sample wt/vol: 1025(mL) Date Analyzed: 05/16/2012 19:51

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 38834 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	76		60-130

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-42 Lab Sample ID: 200-10748-1

Lab Name: TestAmerica Burlington Job No.: 200-10748-2

SDG ID.: PRR1278

Matrix: Water Date Sampled: 05/09/2012 12:00

Reporting Basis: WET Date Received: 05/10/2012 08:55

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	5.7	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-42 Lab Sample ID: 200-10748-1

Lab Name: TestAmerica Burlington Job No.: 200-10748-3

SDG ID.: PRR1278

Matrix: Water Date Sampled: 05/09/2012 12:00

Reporting Basis: WET Date Received: 05/10/2012 08:55

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.1	2.0		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
80009966.0002.70004	Tierra Phase I Removal	PRR1278	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-42	5/9/2012	12:00	water	Grab	17	X	X	X	X	X	X	X	X	X									
TB05092012	5/9/2012		water	–	3		X																

Requested Analyses

1	TOC
2	VOCs
3	SVOCs
4	Arocior PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP WS 15-4 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☒ Cooler packed with ice

☒ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 5.2, 5.8 °C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	05/09/12	1300	[signature] 5/10/12 0855			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCBs as Congeners Analyses

SDG# PRR1278 (33762)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17476R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1278 (33762) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1WATCME-42	33762-001	Soil	5/9/2012				X	X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613
2. PCB – Polychlorinated Biphenyls as Congeners by USEPA Method 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) or the estimated detection limits (EDL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in sample location PRR1WATCME-42. The confirmation analysis was not reported. The concentration of 2,3,7,8-TCDF was less than the PQL.

7. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.

Qualifier	Description
U/ND	Not Detected.

11. Overall Assessment

Overall 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.

CONGENER PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Some sample results required qualification as not detected because the compounds were also detected in the associated method blank and field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank or field blank at or above the project quantitation limits (PQL) during PCB analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as 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).

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-42	PCB-11	Detected sample results > PQL and < BAL	“UB” at detected sample concentration

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.

Qualifier	Description
D	Dilution
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

The laboratory added the qualifier “I” which is defined by the laboratory as “Chemical Interference.“ These samples results were qualified as estimated (J).

The laboratory qualifier “*” was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 21, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - PCB Congeners

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
PCB-1	pg/L	13.3		
PCB-2	pg/L	7.1		
PCB-3	pg/L	4.9	U	U
PCB-4/10	pg/L	9.8	U	U
PCB-5/8	pg/L	25.5		
PCB-6	pg/L	9.8	U	U
PCB-7/9	pg/L	13.7		
PCB-11	pg/L	35.4	B	UB
PCB-12/13	pg/L	29		
PCB-14	pg/L	14.8		
PCB-15	pg/L	13.2		
PCB-16/32	pg/L	17.5		
PCB-17	pg/L	8.81		
PCB-18	pg/L	27.3		
PCB-19	pg/L	4.9	U	U
PCB-20/21/33	pg/L	24.4		
PCB-22	pg/L	11.9		
PCB-23	pg/L	4.9	U	U
PCB-24/27	pg/L	8.6		
PCB-25	pg/L	4.9	U	U
PCB-26	pg/L	7.42		
PCB-28	pg/L	42.6		
PCB-29	pg/L	4.9	U	U
PCB-30	pg/L	4.9	U	U
PCB-31	pg/L	35.1		
PCB-34	pg/L	4.9	U	U
PCB-35	pg/L	4.9	U	U
PCB-36	pg/L	4.9	U	U
PCB-37	pg/L	19.3		
PCB-38	pg/L	4.9	U	U
PCB-39	pg/L	4.9	U	U
PCB-40	pg/L	6.94		
PCB-41/64/71/72	pg/L	35.4		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - PCB Congeners

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
PCB-42/59	pg/L	12.4		
PCB-43/49	pg/L	35.2		
PCB-44	pg/L	36.4		
PCB-45	pg/L	5.78		
PCB-46	pg/L	4.9	U	U
PCB-47	pg/L	16.1		
PCB-48/75	pg/L	10.4		
PCB-50	pg/L	4.9	U	U
PCB-51	pg/L	4.9	U	U
PCB-52/69	pg/L	48.1		
PCB-53	pg/L	5.99		
PCB-54	pg/L	4.9	U	U
PCB-55	pg/L	4.9	U	U
PCB-56/60	pg/L	29.5		
PCB-57	pg/L	4.9	U	U
PCB-58	pg/L	4.9	U	U
PCB-61/70	pg/L	48		
PCB-62	pg/L	4.9	U	U
PCB-63	pg/L	4.9	U	U
PCB-65	pg/L	4.9	U	U
PCB-67	pg/L	4.9	U	U
PCB-68	pg/L	4.9	U	U
PCB-73	pg/L	4.9	U	U
PCB-74	pg/L	34.5		
PCB-76/66	pg/L	43.3		
PCB-77	pg/L	6		
PCB-78	pg/L	4.9	U	U
PCB-79	pg/L	4.9	U	U
PCB-80	pg/L	4.9	U	U
PCB-81	pg/L	1.7	J	J
PCB-82	pg/L	11.3		
PCB-83	pg/L	4.9	U	U
PCB-84/92	pg/L	33.2		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - PCB Congeners

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
PCB-85/116	pg/L	16.2		
PCB-86	pg/L	4.9	U	U
PCB-87/117/125	pg/L	25.2		
PCB-88/91	pg/L	12.3		
PCB-89	pg/L	4.9	U	U
PCB-90/101	pg/L	76.7		
PCB-93	pg/L	4.9	U	U
PCB-94	pg/L	4.9	U	U
PCB-95/98/102	pg/L	53.8		
PCB-96	pg/L	4.9	U	U
PCB-97	pg/L	23.8		
PCB-99	pg/L	50.3		
PCB-100	pg/L	4.9	U	U
PCB-103	pg/L	4.9	U	U
PCB-104	pg/L	4.9	U	U
PCB-105	pg/L	26.6		
PCB-106/118	pg/L	90.7	B	
PCB-107/109	pg/L	8.27		
PCB-108/112	pg/L	4.9	U	U
PCB-110	pg/L	78.1		
PCB-111/115	pg/L	4.9	U	U
PCB-113	pg/L	4.9	U	U
PCB-114	pg/L	13.2		
PCB-119	pg/L	4.9	U	U
PCB-120	pg/L	4.9	U	U
PCB-121	pg/L	4.9	U	U
PCB-122	pg/L	4.9	U	U
PCB-123	pg/L	4.76	U,*	U
PCB-124	pg/L	4.9	U	U
PCB-126	pg/L	2.41	J	J
PCB-127	pg/L	4.9	U	U
PCB-128/162	pg/L	19.4		
PCB-129	pg/L	8.71		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - PCB Congeners

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
PCB-130	pg/L	7.37		
PCB-131	pg/L	4.9	U	U
PCB-132/161	pg/L	27.8		
PCB-133/142	pg/L	5.85		
PCB-134/143	pg/L	5.77		
PCB-135	pg/L	10.6		
PCB-136	pg/L	12.5		
PCB-137	pg/L	10.7		
PCB-138/163/164	pg/L	110	B	
PCB-139/149	pg/L	55.9		
PCB-140	pg/L	4.9	U	U
PCB-141	pg/L	31.1		
PCB-144	pg/L	4.9	U	U
PCB-145	pg/L	4.9	U	U
PCB-146/165	pg/L	17.2		
PCB-147	pg/L	4.9	U	U
PCB-148	pg/L	4.9	U	U
PCB-150	pg/L	4.9	U	U
PCB-151	pg/L	15.6		
PCB-152	pg/L	4.9	U	U
PCB-153	pg/L	110		
PCB-154	pg/L	6.61		
PCB-155	pg/L	4.9	U	U
PCB-156	pg/L	37.3		
PCB-157	pg/L	5.81		
PCB-158/160	pg/L	15.6		
PCB-159	pg/L	4.9	U	U
PCB-166	pg/L	4.9	U	U
PCB-167	pg/L	9.87	U,I	UJ
PCB-168	pg/L	4.9	U	U
PCB-169	pg/L	2.48	U,*	U
PCB-170	pg/L	44.8		
PCB-171	pg/L	9.44	U,I	UJ

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - PCB Congeners

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
PCB-172	pg/L	9.11		
PCB-173	pg/L	4.9	U	U
PCB-174	pg/L	44.6		
PCB-175	pg/L	4.9	U	U
PCB-176	pg/L	8.39		
PCB-177	pg/L	22.3		
PCB-178	pg/L	11.6		
PCB-179	pg/L	21.7		
PCB-180	pg/L	121		
PCB-181	pg/L	4.9	U	U
PCB-182/187	pg/L	67		
PCB-183	pg/L	28.1		
PCB-184	pg/L	4.9	U	U
PCB-185	pg/L	11.6		
PCB-186	pg/L	4.9	U	U
PCB-188	pg/L	4.9	U	U
PCB-189	pg/L	12.3		
PCB-190	pg/L	24.7		
PCB-191	pg/L	4.9	U	U
PCB-192	pg/L	4.9	U	U
PCB-193	pg/L	5.21		
PCB-194	pg/L	66.6		
PCB-195	pg/L	18.2		
PCB-196/203	pg/L	85.6		
PCB-197	pg/L	4.9	U	U
PCB-198	pg/L	6.28		
PCB-199	pg/L	82.4		
PCB-200	pg/L	7.98		
PCB-201	pg/L	9.68		
PCB-202	pg/L	27.7		
PCB-204	pg/L	4.9	U	U
PCB-205	pg/L	16.7		
PCB-206	pg/L	193		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - PCB Congeners

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
PCB-207	pg/L	22.8		
PCB-208	pg/L	50.7		
PCB-209	pg/L	1480		
Total monoCB	pg/L	20.4		
Total diCB	pg/L	132		B
Total triCB	pg/L	203		
Total tetraCB	pg/L	374		
Total pentaCB	pg/L	520		B
Total hexaCB	pg/L	514		B
Total heptaCB	pg/L	433		
Total octaCB	pg/L	321		
Total nonaCB	pg/L	266		
Total decaCB	pg/L	1480		
Total PCB	pg/L	4260		B

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1278 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-42	LQ	VQ
2,3,7,8-TCDD	pg/L	157		
1,2,3,7,8-PeCDD	pg/L	1.63	EMPC	EMPC
1,2,3,4,7,8-HxCDD	pg/L	3.27	U	U
1,2,3,6,7,8-HxCDD	pg/L	7.32	U	U
1,2,3,7,8,9-HxCDD	pg/L	4	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	9.64	J	J
OCDD	pg/L	162		
Total TCDD	pg/L	187		
Total PeCDD	pg/L	28.6		
Total HxCDD	pg/L	26.5		
Total HpCDD	pg/L	22.8		
2,3,7,8-TCDF	pg/L	2.04	J	J
1,2,3,7,8-PeCDF	pg/L	5.5	J	J
2,3,4,7,8-PeCDF	pg/L	25.2	J	J
1,2,3,4,7,8-HxCDF	pg/L	216		
1,2,3,6,7,8-HxCDF	pg/L	36.8		
1,2,3,7,8,9-HxCDF	pg/L	2.62	EMPC	EMPC
2,3,4,6,7,8-HxCDF	pg/L	16.4	J	J
1,2,3,4,6,7,8-HpCDF	pg/L	445		
1,2,3,4,7,8,9-HpCDF	pg/L	28.7		
OCDF	pg/L	967		
Total TCDF	pg/L	107		
Total PeCDF	pg/L	232		
Total HxCDF	pg/L	438		
Total HpCDF	pg/L	550		
WHO Dioxin TEQ(Human/Mammal-NDs used	pg/L	200		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: **PRR1WATCME-42** **EPA Method 1613**

Client Data
Name: ARCADIS U.S., Inc.
Project: PRR1278
Date Collected: 9-May-12
Time Collected: 1200

Sample Data
Matrix: Aqueous
Sample Size: 0.982 L

Laboratory Data
Lab Sample: 33762-001
QC Batch No.: 4432
Date Analyzed DB-5: 15-May-12
Date Received: 10-May-12
Date Extracted: 14-May-12
Date Analyzed DB-225: NA

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	157			
1,2,3,7,8-PeCDD	ND		1.63	
1,2,3,4,7,8-HxCDD	ND	3.27		
1,2,3,6,7,8-HxCDD	ND	7.32		
1,2,3,7,8,9-HxCDD	ND	4.00		
1,2,3,4,6,7,8-HpCDD	9.64			J
OCDD	162			
2,3,7,8-TCDF	2.04			J
1,2,3,7,8-PeCDF	5.50			J
2,3,4,7,8-PeCDF	25.2			J
1,2,3,4,7,8-HxCDF	216			
1,2,3,6,7,8-HxCDF	36.8			
2,3,4,6,7,8-HxCDF	16.4			J
1,2,3,7,8,9-HxCDF	ND		2.62	
1,2,3,4,6,7,8-HpCDF	445			
1,2,3,4,7,8,9-HpCDF	28.7			
OCDF	967			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	79.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	72.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	67.6	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	65.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	64.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	65.3	23 - 140	
	13C-OCDD	62.6	17 - 157	
	13C-2,3,7,8-TCDF	82.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	73.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	75.5	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	68.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	64.5	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	65.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	65.1	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	60.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	64.0	26 - 138	
	13C-OCDF	62.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	98.1	35 - 197	

Totals

Total TCDD	187	191
Total PeCDD	28.6	31.7
Total HxCDD	26.5	
Total HpCDD	22.8	
Total TCDF	107	112
Total PeCDF	232	
Total HxCDF	438	440
Total HpCDF	550	

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 197

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.
e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: MAS

Approved By: Calvin Tanaka 16-May-2012 11:36

Sample ID:	PRR1WATCME-42			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33762-001	Date Received: 10-May-12
Project:	PRR1278	Sample Size: 1.02 L	QC Batch No.: 4423	Date Extracted: 10-May-12
Date Collected:	9-May-12	%Solids: 1.02	Date Analyzed DB-1 11-May-12	
Time Collected:	1200			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	13.3	4.90	
PCB-2	7.10	4.90	
PCB-3	ND	4.90	
PCB-4/10	ND	9.80	
PCB-5/8	25.5	9.80	
PCB-6	ND	9.80	
PCB-7/9	13.7	9.80	
PCB-11	~~35.4~~ ND	~~9.80~~ 35.4	U B
PCB-12/13	29.0	9.80	
PCB-14	14.8	9.80	
PCB-15	13.2	9.80	
PCB-16/32	17.5	4.90	
PCB-17	8.81	4.90	
PCB-18	27.3	4.90	
PCB-19	ND	4.90	
PCB-20/21/33	24.4	4.90	
PCB-22	11.9	4.90	
PCB-23	ND	4.90	
PCB-24/27	8.60	4.90	
PCB-25	ND	4.90	
PCB-26	7.42	4.90	
PCB-28	42.6	4.90	
PCB-29	ND	4.90	
PCB-30	ND	4.90	
PCB-31	35.1	4.90	
PCB-34	ND	4.90	
PCB-35	ND	4.90	
PCB-36	ND	4.90	
PCB-37	19.3	4.90	
PCB-38	ND	4.90	
PCB-39	ND	4.90	
PCB-40	6.94	4.90	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	35.4	4.90	
PCB-42/59	12.4	4.90	
PCB-43/49	35.2	4.90	
PCB-44	36.4	4.90	
PCB-45	5.78	4.90	
PCB-46	ND	4.90	
PCB-47	16.1	4.90	
PCB-48/75	10.4	4.90	
PCB-50	ND	4.90	
PCB-51	ND	4.90	
PCB-52/69	48.1	4.90	
PCB-53	5.99	4.90	
PCB-54	ND	4.90	
PCB-55	ND	4.90	
PCB-56/60	29.5	4.90	
PCB-57	ND	4.90	
PCB-58	ND	4.90	
PCB-61/70	48.0	4.90	
PCB-62	ND	4.90	
PCB-63	ND	4.90	
PCB-65	ND	4.90	
PCB-67	ND	4.90	
PCB-68	ND	4.90	
PCB-73	ND	4.90	
PCB-74	34.5	4.90	
PCB-76/66	43.3	4.90	
PCB-77	6.00	4.90	
PCB-78	ND	4.90	
PCB-79	ND	4.90	
PCB-80	ND	4.90	
PCB-81	1.70	4.90	J
PCB-82	11.3	4.90	

Sample ID:	PRR1WATCME-42			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33762-001	Date Received:	10-May-12
Project:	PRR1278	Sample Size:	1.02 L	QC Batch No.:	4423	Date Extracted:	10-May-12
Date Collected:	9-May-12	%Solids:	1.02	Date Analyzed DB-1	11-May-12		
Time Collected:	1200						

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	4.90		PCB-127	ND	4.90	
PCB-84/92	33.2	4.90		PCB-128/162	19.4	4.90	
PCB-85/116	16.2	4.90		PCB-129	8.71	4.90	
PCB-86	ND	4.90		PCB-130	7.37	4.90	
PCB-87/117/125	25.2	4.90		PCB-131	ND	4.90	
PCB-88/91	12.3	4.90		PCB-132/161	27.8	4.90	
PCB-89	ND	4.90		PCB-133/142	5.85	4.90	
PCB-90/101	76.7	4.90		PCB-134/143	5.77	4.90	
PCB-93	ND	4.90		PCB-135	10.6	4.90	
PCB-94	ND	4.90		PCB-136	12.5	4.90	
PCB-95/98/102	53.8	4.90		PCB-137	10.7	4.90	
PCB-96	ND	4.90		PCB-138/163/164	110	4.90	~~B~~
PCB-97	23.8	4.90		PCB-139/149	55.9	4.90	
PCB-99	50.3	4.90		PCB-140	ND	4.90	
PCB-100	ND	4.90		PCB-141	31.1	4.90	
PCB-103	ND	4.90		PCB-144	ND	4.90	
PCB-104	ND	4.90		PCB-145	ND	4.90	
PCB-105	26.6	4.90		PCB-146/165	17.2	4.90	
PCB-106/118	90.7	4.90	~~B~~	PCB-147	ND	4.90	
PCB-107/109	8.27	4.90		PCB-148	ND	4.90	
PCB-108/112	ND	4.90		PCB-150	ND	4.90	
PCB-110	78.1	4.90		PCB-151	15.6	4.90	
PCB-111/115	ND	4.90		PCB-152	ND	4.90	
PCB-113	ND	4.90		PCB-153	110	4.90	
PCB-114	13.2	4.90		PCB-154	6.61	4.90	
PCB-119	ND	4.90		PCB-155	ND	4.90	
PCB-120	ND	4.90		PCB-156	37.3	4.90	
PCB-121	ND	4.90		PCB-157	5.81	4.90	
PCB-122	ND	4.90		PCB-158/160	15.6	4.90	
PCB-123	ND	4.76	~~*~~	PCB-159	ND	4.90	
PCB-124	ND	4.90		PCB-166	ND	4.90	
PCB-126	2.41	4.90	J	PCB-167	ND	9.87	~~I~~ J

Sample ID:	PRR1WATCME-42			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33762-001	Date Received:	10-May-12
Project:	PRR1278	Sample Size:	1.02 L	QC Batch No.:	4423	Date Extracted:	10-May-12
Date Collected:	9-May-12	%Solids:	1.02	Date Analyzed DB-1	11-May-12		
Time Collected:	1200						

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	4.90	
PCB-169	ND	2.48	~~*~~
PCB-170	44.8	4.90	
PCB-171	ND	9.44	~~I~~ J
PCB-172	9.11	4.90	
PCB-173	ND	4.90	
PCB-174	44.6	4.90	
PCB-175	ND	4.90	
PCB-176	8.39	4.90	
PCB-177	22.3	4.90	
PCB-178	11.6	4.90	
PCB-179	21.7	4.90	
PCB-180	121	4.90	
PCB-181	ND	4.90	
PCB-182/187	67.0	4.90	
PCB-183	28.1	4.90	
PCB-184	ND	4.90	
PCB-185	11.6	4.90	
PCB-186	ND	4.90	
PCB-188	ND	4.90	
PCB-189	12.3	4.90	
PCB-190	24.7	4.90	
PCB-191	ND	4.90	
PCB-192	ND	4.90	
PCB-193	5.21	4.90	
PCB-194	66.6	4.90	
PCB-195	18.2	4.90	
PCB-196/203	85.6	4.90	
PCB-197	ND	4.90	
PCB-198	6.28	4.90	
PCB-199	82.4	4.90	
PCB-200	7.98	4.90	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	9.68	4.90	
PCB-202	27.7	4.90	
PCB-204	ND	4.90	
PCB-205	16.7	4.90	
PCB-206	193	4.90	
PCB-207	22.8	4.90	
PCB-208	50.7	4.90	
PCB-209	1480	4.90	
Total monoCB	20.4	4.90	
Total diCB	132	9.80	~~B~~
Total triCB	203	4.90	
Total tetraCB	374	4.90	
Total pentaCB	520	4.90	~~B~~
Total hexaCB	514	4.90	~~B~~
Total heptaCB	433	4.90	
Total octaCB	321	4.90	
Total nonaCB	266	4.90	
Total decaCB	1480	4.90	
Total PCB	4260	9.80	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: **0.248**

Sample ID:	PRR1WATCME-42			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33762-001	Date Received: 10-May-12
Project:	PRR1278	Sample Size: 1.02 L	QC Batch No.: 4423	Date Extracted: 10-May-12
Date Collected:	9-May-12		Date Analyzed 11-May-12	
Time Collected:	1200			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-1	71.6	25	150	
	13C-PCB-3	76.2	25	150	
	13C-PCB-4	68.7	25	150	
	13C-PCB-11	76.1	25	150	
	13C-PCB-9	72.9	25	150	
	13C-PCB-19	78.5	25	150	
	13C-PCB-28	86.2	25	150	
	13C-PCB-32	80.2	25	150	
	13C-PCB-37	95.5	25	150	
	13C-PCB-47	79.2	25	150	
	13C-PCB-52	80.2	25	150	
	13C-PCB-54	71.4	25	150	
	13C-PCB-70	80.2	25	150	
	13C-PCB-77	81.8	25	150	
	13C-PCB-80	75.4	25	150	
	13C-PCB-81	81.3	25	150	
	13C-PCB-95	78.1	25	150	
	13C-PCB-97	81.6	25	150	
	13C-PCB-101	82.9	25	150	
	13C-PCB-104	81.0	25	150	
	13C-PCB-105	91.8	25	150	
	13C-PCB-114	90.5	25	150	
	13C-PCB-118	81.0	25	150	
	13C-PCB-123	86.5	25	150	
	13C-PCB-126	97.8	25	150	
	13C-PCB-127	91.3	25	150	
	13C-PCB-138	84.4	25	150	
	13C-PCB-141	83.3	25	150	
	13C-PCB-153	82.9	25	150	
	13C-PCB-155	75.6	25	150	

Chemist: MAS

Approved by: Calvin Tanaka 16-May-2012 15:33

Sample ID:	PRR1WATCME-42			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33762-001	Date Received: 10-May-12
Project:	PRR1278	Sample Size: 1.02 L	QC Batch No.: 4423	Date Extracted: 10-May-12
Date Collected:	9-May-12		Date Analyzed 11-May-12	
Time Collected:	1200			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-156	81.5	25	150	
	13C-PCB-157	81.8	25	150	
	13C-PCB-159	81.6	25	150	
	13C-PCB-167	85.3	25	150	
	13C-PCB-169	85.3	25	150	
	13C-PCB-170	77.7	25	150	
	13C-PCB-180	79.9	25	150	
	13C-PCB-188	71.3	25	150	
	13C-PCB-189	78.2	25	150	
	13C-PCB-194	81.1	25	150	
	13C-PCB-202	71.5	25	150	
	13C-PCB-206	75.0	25	150	
	13C-PCB-208	71.5	25	150	
	13C-PCB-209	77.7	25	150	
CRS	13C-PCB-79	88.3	30	135	
	13C-PCB-178	84.4	30	135	

Chemist: MAS

Approved by: Calvin Tanaka 16-May-2012 15:33

ARCADIS
infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33762 3.1°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1278	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-42	5/9/2012	12:00	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins (17 isomers) and Total PCDD/PCDFs
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	05/09/12	1300	5/10/12 0755 Bethina L Benedict			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1282 (200-10771)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17480R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1282 (200-10771) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-20-SP-105	200-10771-1	Water	5/10/2012		X				
PRR1WATGACE-20-SP-106	200-10771-2	Water	5/10/2012		X				
PRR1WATGACE-20-SP-109	200-10771-3	Water	5/10/2012		X				
PRR1WATCME-43	200-10771-4	Water	5/10/2012						X
PRR1WAT-20-SP-101	200-10771-5	Water	5/10/2012						X
TB05102012	200-10771-6	Water	5/10/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-20-SP-105	Chlorobenzene	1100 E	1000 D	1000 D
PRR1WATGACE-20-SP-106	Chlorobenzene	990 E	930 D	930 D
PRR1WATGACE-20-SP-109	Chlorobenzene	100 E	160 D	160 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 10, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1282 - VOCs

ANALYTE	Units	PRR1WATGACE-20-SP-106	LQ	VQ	PRR1WATGACE-20-SP-109	LQ	VQ	PRR1WATGACI-20-SP-105	LQ	VQ
2-Butanone	ug/L	110			35			17 J		J
Chlorobenzene	ug/L	930 D		D	160 D		D	1000 D		D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1282 - Miscellaneous

ANALYTE	Units	PRR1WAT-20-SP-101	LQ	VQ	PRR1WATCME-43	LQ	VQ
Total Suspended Solids	mg/L	25.1			3.1		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-20-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 8.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	110	
108-90-7	Chlorobenzene	930 ~~990~~ ~~E~~ D	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-20-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 61.1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	82	J D
108-90-7	Chlorobenzene	930	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-20-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	35	
108-90-7	Chlorobenzene	160 ~~180~~ ~~E~~ D	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-20-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 11.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	35	J D
108-90-7	Chlorobenzene	160	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-20-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 9.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	17	J
108-90-7	Chlorobenzene	1000 ~~1100~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACI-20-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 68.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	340	U
108-90-7	Chlorobenzene	1000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05102012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1282

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10771-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJB14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/11/2012

% Moisture: not dec. Date Analyzed: 05/11/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-43 Lab Sample ID: 200-10771-4

Lab Name: TestAmerica Burlington Job No.: 200-10771-2

SDG ID.: PRR1282

Matrix: Water Date Sampled: 05/10/2012 11:00

Reporting Basis: WET Date Received: 05/11/2012 09:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	3.1	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-20-SP-101 Lab Sample ID: 200-10771-5

Lab Name: TestAmerica Burlington Job No.: 200-10771-2

SDG ID.: PRR1282

Matrix: Water Date Sampled: 05/10/2012 11:20

Reporting Basis: WET Date Received: 05/11/2012 09:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	25.1	2.0		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1282	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-20-SP-105	5/10/2012	11:15	water	Grab	3	X																	
PRR1WATGACE-20-SP-106	5/10/2012	11:10	water	Grab	3	X																	
PRR1WATGACE-20-SP-109	5/10/2012	11:05	water	Grab	3	X																	
PRR1WATCME-43	5/10/2012	11:00	water	Grab	1		X																
PRR1WAT-20-SP-101	5/10/2012	11:20	water	Grab	1		X																
TB05102012	5/10/2012		water	Grab	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 5.0°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Lia Brunig	5/10/12	1230	NAP			
NAP	05/10/12	1500	5/11/12 TARSA 0920			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Miscellaneous Analysis

SDG# PRR1285 (200-10798)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17485R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1285 (200-10798) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-44	200-10798-1	Water	5/11/2012						X
PRR1WATCME-45	200-10798-2	Water	5/12/2012						X

Notes:

1. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 11, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1285 - Miscellaneous

ANALYTE	Units	PRR1WATCME-44	LQ	VQ	PRR1WATCME-45	LQ	VQ
Total Suspended Solids	mg/L	5.2			6		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-44 Lab Sample ID: 200-10798-1

Lab Name: TestAmerica Burlington Job No.: 200-10798-1

SDG ID.: PRR1285

Matrix: Water Date Sampled: 05/11/2012 09:00

Reporting Basis: WET Date Received: 05/14/2012 09:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.2	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-45 Lab Sample ID: 200-10798-2

Lab Name: TestAmerica Burlington Job No.: 200-10798-1

SDG ID.: PRR1285

Matrix: Water Date Sampled: 05/12/2012 09:00

Reporting Basis: WET Date Received: 05/14/2012 09:45

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.0	1.9		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1285	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-44	5/11/2012	9:00	WATER	GRAB	1	X																	
PRR1WATCME-45	5/12/2012	9:00	WATER	GRAB	1	X																	

Page 1 of 2

Requested Analyses	
1	TSS
2	
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15	
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17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 4.6°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig A. Burns Jr	5/12/12	9:00 am	JASUR 5/14/12 0945			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/18/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1288 (200-10822-1&2)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17518R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1288 (200-10822-1&2) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-21-SP-105	200-10822-1	Water	5/15/2012		X				
PRR1WATGACE-21-SP-106	200-10822-2	Water	5/15/2012		X				
PRR1WATGACE-21-SP-109	200-10822-3	Water	5/15/2012		X				
PRR1WATCME-47	200-10822-4	Water	5/15/2012						X
PRR1WAT-21-SP-101	200-10822-5	Water	5/15/2012						X
TB05152012	200-10822-6	Water	5/15/2012		X				
PRR1WATCME-46	200-10822-7	Water	5/14/2012						X

1. Volatiles by USEPA SOM0.1.2
2. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis. Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits for all surrogates associated with target compounds.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-21-SP-105	Chlorobenzene	14000 E	12000 D	12000 D
PRR1WATGACE-21-SP-106	Chlorobenzene	2300 E	2300 D	2300 D
PRR1WATGACE-21-SP-109	Chlorobenzene	2100 E	1900 D	1900 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

A MS analysis was not performed on a sample location associated with this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location associated with this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

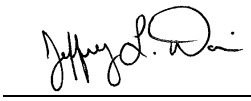
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: October 11, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1288 - VOCs

ANALYTE	Units	PRR1WATGACE-21-SP-106	LQ	VQ	PRR1WATGACE-21-SP-109	LQ	VQ	PRR1WATGACI-21-SP-105	LQ	VQ
2-Butanone	ug/L	150			51 J		J	580 U		U
Chlorobenzene	ug/L	2300 D		D	1900 D		D	12000 D		D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1288 - Miscellaneous

ANALYTE	Units	PRR1WAT-21-SP-101	LQ	VQ	PRR1WATCME-46	LQ	VQ	PRR1WATCME-47	LQ	VQ
Total Suspended Solids	mg/L	28.6			10.2			5.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-21-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 22.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	150	
108-90-7	Chlorobenzene	2300 ~~2300~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-21-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 151.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	130	J D
108-90-7	Chlorobenzene	2300	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-21-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 19.1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	51	J
108-90-7	Chlorobenzene	1900 ~~2100~~	E ~~D~~

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-21-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 137.5

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	690	U
108-90-7	Chlorobenzene	1900	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-21-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 115.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	580	U
108-90-7	Chlorobenzene	12000 ~~14000~~	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-21-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 814.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	4100	U
108-90-7	Chlorobenzene	12000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05152012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1288

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10822-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJE23.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/16/2012

% Moisture: not dec. Date Analyzed: 05/16/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-47
Lab Sample ID: 200-10822-4
Lab Name: TestAmerica Burlington
Job No.: 200-10822-2
SDG ID.: PRR1288
Matrix: Water
Date Sampled: 05/15/2012 11:05
Reporting Basis: WET
Date Received: 05/16/2012 08:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	5.4	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-21-SP-101 Lab Sample ID: 200-10822-5

Lab Name: TestAmerica Burlington Job No.: 200-10822-2

SDG ID.: PRR1288

Matrix: Water Date Sampled: 05/15/2012 11:25

Reporting Basis: WET Date Received: 05/16/2012 08:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	28.6	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-46 Lab Sample ID: 200-10822-7

Lab Name: TestAmerica Burlington Job No.: 200-10822-2

SDG ID.: PRR1288

Matrix: Water Date Sampled: 05/14/2012 10:02

Reporting Basis: WET Date Received: 05/16/2012 08:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	10.2	2.0		mg/L			1	SM 2540D

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6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1288	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-21-SP-105	5/15/2012	11:20	water	Grab	3	X																	
PRR1WATGACE-21-SP-106	5/15/2012	11:15	water	Grab	3	X																	
PRR1WATGACE-21-SP-109	5/15/2012	11:10	water	Grab	3	X																	
PRR1WATCME-47	5/15/2012	11:05	water	Grab	1		X																
PRR1WAT-21-SP-101	5/15/2012	11:25	water	Grab	1		X																
TB05152012	5/15/2012		water	Grab	3	X																	
PRR1WATCME-46	5/14/2012	10:02	water	Grab	1		X																

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	5/15/12	1250	[signature] TARUS 5/16/12 0830			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	05/15/12	1500				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/18/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1290 (200-10832-1, 200-10832-2 and 200-10832-3)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17520R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1290 (200-10832-1, 200-10832-2 and 200-10832-3) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCB/ HERB	MET	MISC
PRR1WATCME-48	200-10832-1	Water	5/16/2012		X	X	X	X	X
TB05162012	200-10832-2	Water	5/16/2012		X				

1. Miscellaneous parameters include Total Suspended Solids (TSS) and Total Organic Carbon (TOC).
2. PEST/PCBs includes Pesticides, and PCBs by USEPA SOM01.2, and Chlorinated Herbicides by SW846 8151A
3. Volatiles and Semivolatiles by USEPA SOM0.1.2.
4. Metals by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during SVOC analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of carbon tetrachloride. This compound was detected in the sample at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during volatile analysis.

The method blank exhibited concentrations less than the PQL for carbon tetrachloride. This compound was detected in sample PRR1WATCME-48 at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. This compound is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

This SDG contains a dilution analysis. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of alpha-BHC, beta-BHC and endrin aldehyde. These compounds were detected in one sample at a concentration less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination.

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during pesticide analysis.

The method blank exhibited concentrations less than the PQL for alpha-BHC, beta-BHC and endrin aldehyde. These compounds were detected in sample PRR1WATCME-48 at concentrations less than five times the method blank concentration; therefore, these compounds in the sample are most likely from laboratory contamination. These compounds are reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate

overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, pesticide compounds were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. 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
PRR1WATCME-48	Heptachlor	999.9%
	Aldrin	999.9%
	Heptachlor epoxide	441.0%
	Endosulfan I	126.3%

Sample Locations	Compound	%D
	Endrin	67.9%
	Endosulfan sulfate	999.9%
	alpha-Chlordane	814.3%
	gamma-Chlordane	401.8%
	delta-BHC	330.8%
	gamma-BHC	36.3%
	2,4'-DDE	213.1%
	2,4'-DDD	42.3%

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
>25% to 70%	J
>70% to 100%	JN
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.

Qualifier	Description
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCB analysis

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, Aroclor PCBs were successfully recovered during the LCS determination.

6. 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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

One sample location exhibited results that exceeded 25% RPD between GC columns. Sample results are evaluated in section 6, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extraction and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during herbicide analysis.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analysis and method blank exhibited surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and

equipment as those used for sample analyses.

The LCSs were processed at the proper frequency. Upon evaluation, herbicide compounds were successfully recovered during the LCS determination.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATCME-48	2,4-D	25.3%

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
>25% to 70%	J
>70% to 100%	JN

Control Limit (%D)	Qualification
>100%	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (pesticide sample results less than the RL)	U

When the pesticide sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

TOTAL METALS and CYANIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited low level concentrations of chromium and lead. These analytes were detected in the sample at concentrations less than five times the method blank concentration; therefore, these analytes in the sample are most likely from laboratory contamination.

The LCS recoveries for several compounds were above the control limit. Therefore, positive results for the affected compounds indicate potential high bias.

The laboratory duplicate exhibited a RPD above the control limit. Therefore, the affected compounds are qualified as estimated.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The digestion and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations less than the PQL for chromium and lead. These analytes were detected in sample PRR1WATCME-48 at concentrations less than five times the method blank concentration; therefore, these analytes in the sample are most likely from laboratory contamination. The sample results are reported at the PQL for chromium and at the sample concentration for lead and flagged UB indicating non-detect due to blank contamination.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. All LCS recoveries were within control limits, with the exception of the analytes associated with sample locations, as presented in the following table.

Sample Location	Analytes	LCS Recovery
PRR1WATCME-48	Antimony	121%
	Lead	125%
	Silver	143%
	Zinc	137%

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

Control limit	Sample Result	Qualification
LCS (water) percent recovery 50% to 79%	Non-detect	UJ
	Detect	J
LCS (water) percent recovery <50%	Non-detect	R
	Detect	J
LCS (water) percent recovery >120%	Non-detect	No Action
	Detect	J
LCS (soil) percent recovery < lower limit	Non-detect	UJ
	Detect	J
LCS (soil) percent recovery > upper limit	Non-detect	No Action
	Detect	J

4. MATRIX SPIKE (MS)

An MS is generated to determine the accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis exhibited recoveries within the control limits.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify

data.

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
PRR1WATCME-48	Zinc	31%

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

6. SERIAL DILUTION

All serial dilutions were within control limits.

7. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

TOC and TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the method blank at or above the project quantitation limits (PQL) during TSS analysis. Compounds were detected in the associated QA blanks; however, the associated TOC results were greater than the BAL. 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

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

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

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

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

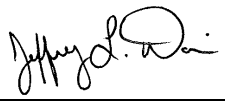
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.

Qualifier	Description
*	Duplicate analysis not within control limits

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: October 15, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 18, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - PCBs

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
Aroclor-1016	ug/L	1	U	U
Aroclor-1221	ug/L	1	U	U
Aroclor-1232	ug/L	1	U	U
Aroclor-1242	ug/L	1	U	U
Aroclor-1248	ug/L	1	U	U
Aroclor-1254	ug/L	1	U	U
Aroclor-1260	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - Pesticides

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
2,4'-DDD	ug/L	0.0071 J P		J
2,4'-DDE	ug/L	0.01 J P		U
2,4'-DDT	ug/L	0.013		
4,4'-DDD	ug/L	0.02		
4,4'-DDE	ug/L	0.0076 J		J
4,4'-DDT	ug/L	0.062		
Aldrin	ug/L	0.0051 J B P		U
Alpha-BHC	ug/L	0.0051 J B P		UB
Alpha-Chlordane	ug/L	0.0051 J P		U
Beta-BHC	ug/L	0.0051 J B P		UB
Delta-BHC	ug/L	0.0087 B P		JN
Dieldrin	ug/L	0.01 U		U
Endosulfan I	ug/L	0.0051 J P		U
Endosulfan II	ug/L	0.0032 J		J
Endosulfan Sulfate	ug/L	0.01 J P		U
Endrin	ug/L	0.01 J P		U
Endrin Aldehyde	ug/L	0.01 J B P		UB
Gamma-BHC (Lindane)	ug/L	0.000089 J P		J
Gamma-Chlordane	ug/L	0.0051 J P		U
Heptachlor	ug/L	0.0051 J P		U
Heptachlor Epoxide	ug/L	0.0051 J P		U
Toxaphene	ug/L	0.51 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - Herbicides

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
2,4,5-T	ug/L	0.48	U	U
2,4-D	ug/L	1	J	J
2,4-DB	ug/L	0.57	J	J
Dinoseb	ug/L	0.97	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - VOCs

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	U
1,1,2-Trichloroethane	ug/L	1	U	U
1,1-Dichloroethane	ug/L	1	U	U
1,1-Dichloroethene	ug/L	1	U	U
1,2,3-Trichlorobenzene	ug/L	1	U	U
1,2,4-Trichlorobenzene	ug/L	1	U	U
1,2-Dichlorobenzene	ug/L	1	U	U
1,2-Dichloroethane	ug/L	1	U	U
1,2-Dichloropropane	ug/L	1	U	U
1,3-Dichlorobenzene	ug/L	1	U	U
1,4-Dichlorobenzene	ug/L	1	U	U
2-Butanone	ug/L	12		
Acrolein	ug/L	20	U	U
Acrylonitrile	ug/L	20	U	U
Benzene	ug/L	0.062	J	J
Bromodichloromethane	ug/L	1	U	U
Bromoform	ug/L	1	U	U
Bromomethane	ug/L	1	U	U
Carbon Tetrachloride	ug/L	1	J B	UB
Chlorobenzene	ug/L	0.24	J	J
Chloroethane	ug/L	0.1	J	J
Chloroform	ug/L	1.9		
Chloromethane	ug/L	0.3	J	J
cis-1,3-Dichloropropene	ug/L	1	U	U
Dibromochloromethane	ug/L	1	U	U
Ethylbenzene	ug/L	1	U	U
Methylene Chloride	ug/L	30	B	
Tetrachloroethene	ug/L	1	U	U
Toluene	ug/L	1	U	U
trans-1,2-Dichloroethene	ug/L	1	U	U
trans-1,3-Dichloropropene	ug/L	1	U	U
Trichloroethene	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - VOCs

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
Vinyl Chloride	ug/L	1 U		U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - SVOCs

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	5.1	U	U
2,4,5-Trichlorophenol	ug/L	5.1	U	U
2,4,6-Trichlorophenol	ug/L	5.1	U	U
2,4-Dichlorophenol	ug/L	5.1	U	U
2,4-Dimethylphenol	ug/L	5.1	U	U
2,4-Dinitrophenol	ug/L	10	U	U
2,4-Dinitrotoluene	ug/L	5.1	U	U
2,6-Dinitrotoluene	ug/L	5.1	U	U
2-Chlorophenol	ug/L	5.1	U	U
2-Nitrophenol	ug/L	5.1	U	U
3,3'-Dichlorobenzidine	ug/L	5.1	U	U
4,6-Dinitro-2-methylphenol	ug/L	10	U	U
4-Nitrophenol	ug/L	10	U	U
Anthracene	ug/L	5.1	U	U
Benzidine	ug/L	10	U	U
Benzo(a)anthracene	ug/L	5.1	U	U
Benzo(a)pyrene	ug/L	5.1	U	U
Benzo(b)fluoranthene	ug/L	5.1	U	U
Benzo(k)fluoranthene	ug/L	5.1	U	U
bis(2-Chloroethyl)ether	ug/L	5.1	U	U
bis(2-Ethylhexyl)phthalate	ug/L	5.1	U	U
Butylbenzylphthalate	ug/L	5.1	U	U
Chrysene	ug/L	5.1	U	U
Dibenzo(a,h)anthracene	ug/L	5.1	U	U
Diethylphthalate	ug/L	5.1	U	U
Dimethylphthalate	ug/L	5.1	U	U
Di-n-Butylphthalate	ug/L	5.1	U	U
Fluoranthene	ug/L	5.1	U	U
Fluorene	ug/L	5.1	U	U
Hexachlorobenzene	ug/L	5.1	U	U
Hexachlorobutadiene	ug/L	5.1	U	U
Hexachlorocyclopentadiene	ug/L	5.1	U	U
Hexachloroethane	ug/L	5.1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - SVOCs

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	5.1	U	U
Isophorone	ug/L	5.1	U	U
Naphthalene	ug/L	5.1	U	U
Nitrobenzene	ug/L	5.1	U	U
N-Nitrosodimethylamine	ug/L	10	U	U
N-Nitrosodiphenylamine	ug/L	5.1	U	U
Pentachlorophenol	ug/L	10	U	U
Phenanthrene	ug/L	5.1	U	U
Phenol	ug/L	5.1	U	U
Pyrene	ug/L	5.1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - Inorganics

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
Antimony	ug/L	14.7	E	J
Arsenic	ug/L	4.6		
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	2	J	UB
Copper	ug/L	3.4		
Cyanide	ug/L	3.4	J	J
Lead	ug/L	1.2		UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	14.2		
Selenium	ug/L	4.2	J	J
Silver	ug/L	1	U	U
Zinc	ug/L	34.5	*	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1290 - Miscellaneous

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
Total Organic Carbon	mg/L	5.9	B	
Total Suspended Solids	mg/L	2	U	U

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINA15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/17/2012

% Moisture: not dec. _____ Date Analyzed: 05/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.30	J
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	0.10	J
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	30	~~B~~
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	12	
67-66-3	Chloroform	1.9	
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0 0.033	~~J B~~ U
71-43-2	Benzene	0.062	J
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINA15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/17/2012

% Moisture: not dec. Date Analyzed: 05/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	0.24	J
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05162012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINA17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/17/2012

% Moisture: not dec. Date Analyzed: 05/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.086	J B
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.018	J B
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
TB05162012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINA17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/17/2012

% Moisture: not dec. Date Analyzed: 05/18/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 990 (g/mL) mL Lab File ID: RJZVP10.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/17/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/17/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/23/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	5.1	U
111-44-4	Bis(2-chloroethyl)ether	5.1	U
95-57-8	2-Chlorophenol	5.1	U
108-60-1	2,2'-Oxybis(1-chloropropane)	5.1	U
67-72-1	Hexachloroethane	5.1	U
98-95-3	Nitrobenzene	5.1	U
78-59-1	Isophorone	5.1	U
88-75-5	2-Nitrophenol	5.1	U
105-67-9	2,4-Dimethylphenol	5.1	U
120-83-2	2,4-Dichlorophenol	5.1	U
91-20-3	Naphthalene	5.1	U
87-68-3	Hexachlorobutadiene	5.1	U
77-47-4	Hexachlorocyclopentadiene	5.1	U
88-06-2	2,4,6-Trichlorophenol	5.1	U
95-95-4	2,4,5-Trichlorophenol	5.1	U
131-11-3	Dimethylphthalate	5.1	U
606-20-2	2,6-Dinitrotoluene	5.1	U
51-28-5	2,4-Dinitrophenol	10	U
100-02-7	4-Nitrophenol	10	U
121-14-2	2,4-Dinitrotoluene	5.1	U
84-66-2	Diethylphthalate	5.1	U
86-73-7	Fluorene	5.1	U
534-52-1	4,6-Dinitro-2-methylphenol	10	U
86-30-6	N-Nitrosodiphenylamin [1]	5.1	U
118-74-1	Hexachlorobenzene	5.1	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.1	U
120-12-7	Anthracene	5.1	U
84-74-2	Di-n-butylphthalate	5.1	U
206-44-0	Fluoranthene	5.1	U
92-87-5	Benzidine	10	U
129-00-0	Pyrene	5.1	U

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 990 (g/mL) mL Lab File ID: RJZVP10.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/17/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/17/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/23/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	5.1	U
91-94-1	3,3'-Dichlorobenzidine	5.1	U
56-55-3	Benzo(a)anthracene	5.1	U
218-01-9	Chrysene	5.1	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.1	U
205-99-2	Benzo(b)fluoranthene	5.1	U
207-08-9	Benzo(k)fluoranthene	5.1	U
50-32-8	Benzo(a)pyrene	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.1	U
53-70-3	Dibenzo(a,h)anthracene	5.1	U

[1] Cannot be separated from Diphenylamine

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 990 (g/mL) mL Lab File ID: 23MAY121512-R041.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 05/17/2012

Extraction: (Type) SEPF Date Extracted: 05/17/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/23/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L		Q
319-84-6	alpha-BHC	0.005/	~~0.000063~~	~~J B P~~ UB
319-85-7	beta-BHC	0.005/	~~0.00074~~	~~J B P~~ UB
319-86-8	delta-BHC		0.0087	~~B P~~ JN
58-89-9	gamma-BHC (Lindane)		0.000089	J ~~P~~
76-44-8	Heptachlor	0.005/	~~0.000048~~	~~J P~~ U
309-00-2	Aldrin	0.005/	~~0.00017~~	~~J B P~~ U
1024-57-3	Heptachlor epoxide	0.005/	~~0.00022~~	~~J P~~ U
959-98-8	Endosulfan I	0.005/	~~0.00019~~	~~J P~~ U
60-57-1	Dieldrin		0.010	U
72-55-9	4,4'-DDE		0.0076	J
72-20-8	Endrin	0.01/	~~0.00037~~	~~J P~~ U
33213-65-9	Endosulfan II		0.0032	J
72-54-8	4,4'-DDD		0.020	
1031-07-8	Endosulfan sulfate	0.01/	~~0.00013~~	~~J P~~ U
50-29-3	4,4'-DDT		0.062	
7421-93-4	Endrin aldehyde	0.01/	~~0.00038~~	~~J B P~~ UB
5103-71-9	alpha-Chlordane	0.005/	~~0.00033~~	~~J P~~ U
5103-74-2	gamma-Chlordane	0.005/	~~0.00023~~	~~J P~~ U
8001-35-2	Toxaphene		0.51	U

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 990 (g/mL) mL Lab File ID: 23MAY121452-R041.D

% Moisture: _____ Decanted: (Y/N) __ Date Received: 05/17/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/17/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/23/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.01 ~~0.0017~~	~~J P~~ U
789-02-6	2,4'-DDT	0.013	
53-19-0	2,4'-DDD	0.0071	J ~~P~~

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1290

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10832-1

Sample wt/vol: 990 (g/mL) mL Lab File ID: 23MAY121601-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/17/2012

Extraction: (Type) SEPF Date Extracted: 05/17/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/23/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10832-2

SDG No.: PRR1290

Client Sample ID: PRR1WATCME-48 Lab Sample ID: 200-10832-1

Matrix: Water Lab File ID: 23may120914-r051.d

Analysis Method: 8151A Date Collected: 05/16/2012 09:30

Extraction Method: 8151A Date Extracted: 05/17/2012 10:53

Sample wt/vol: 975(mL) Date Analyzed: 05/23/2012 11:50

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39135 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	1.0	J	1.9	0.67
88-85-7	Dinoseb	0.97	U	0.97	0.19

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	105		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10832-2

SDG No.: PRR1290

Client Sample ID: PRR1WATCME-48 Lab Sample ID: 200-10832-1

Matrix: Water Lab File ID: 23may120914-r051.d

Analysis Method: 8151A Date Collected: 05/16/2012 09:30

Extraction Method: 8151A Date Extracted: 05/17/2012 10:53

Sample wt/vol: 975(mL) Date Analyzed: 05/23/2012 11:50

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39135 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-82-6	2,4-DB	0.57	J	1.7	0.48
93-76-5	2,4,5-T	0.48	U	0.48	0.13

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	82		60-130

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1290

Matrix: WATER Lab Sample Id: 200-10832-1

% Solids: Date Received: 05/17/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	14.7		~~E~~ J	MS
7440-38-2	Arsenic	4.6			MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	2 ~~1.2~~	~~J~~	UB	MS
7440-50-8	Copper	3.4			MS
7439-92-1	Lead	1.2		UB	MS
7440-02-0	Nickel	14.2			MS
7782-49-2	Selenium	4.2	J		MS
7440-22-4	Silver	1.0	U		MS
7440-66-6	Zinc	34.5		~~*~~ J	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1290
Matrix: WATER Lab Sample Id: 200-10832-1
% Solids: Date Received: 05/17/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-48

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1290
Matrix: WATER Lab Sample Id: 200-10832-1
% Solids: Date Received: 05/17/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	3.4	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-48 | Lab Sample ID: 200-10832-1

Lab Name: TestAmerica Burlington | Job No.: 200-10832-2

SDG ID.: PRR1290

Matrix: Water | Date Sampled: 05/16/2012 09:30

Reporting Basis: WET | Date Received: 05/17/2012 08:05

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	5.9	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-48 Lab Sample ID: 200-10832-1

Lab Name: TestAmerica Burlington Job No.: 200-10832-3

SDG ID.: PRR1290

Matrix: Water Date Sampled: 05/16/2012 09:30

Reporting Basis: WET Date Received: 05/17/2012 08:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	2.0	2.0		mg/L	U		1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1290	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-48	5/16/2012	9:30	water	Grab	17	X	X	X	X	X	X	X	X	X									
TB05162012	5/16/2012	9:30	water	-	3		X																

Page 6 of 241

	Requested Analyses
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP WS 15-4 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT
Shipping Tracking #
Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☐ Cooler packed with ice
☐ Cooler custody seal intact

Sample Receipt:
Condition/Cooler Temp: 3.6

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	05/16/12		TABV2 5/17/12 0905			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/30/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCB Congener Analyses

SDG# PRR1290 (33785)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17521R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1290 (33785) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PCB	MET	PCDD /PCDF
PRR1WATCME-48	33785-001	Water	5/16/2012				X		X

1. PCDD/PCDF by EPA Method 1613.
2. PCBs – PCB Congeners by USEPA 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was not detected in the sample PRR1WATCME-48.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

PCB CONGENERS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The method blank exhibited concentrations of PCB-11. This compound was detected in one sample at a concentration less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. The method blank exhibited concentrations of PCB-11 greater than the PQL. This compound was detected in sample PRR1WATCME-48 at concentrations less than five times the method blank concentration; therefore, this compound in the sample is most likely from laboratory contamination. This compound is reported at the PQL and flagged UB indicating non-detect due to blank contamination.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCB Congeners are spiked with labeled compound spiking standard (internal standard) prior to extraction. The concentration of the congeners is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

6. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

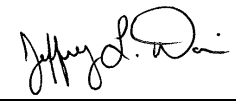
The laboratory qualifier "*" was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE:



DATE: October 15, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 18, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - PCB Congeners

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
PCB-1	pg/L	9.7		
PCB-2	pg/L	6.13		
PCB-3	pg/L	6.41		
PCB-4/10	pg/L	10.2	U	U
PCB-5/8	pg/L	10.2	U	U
PCB-6	pg/L	10.2	U	U
PCB-7/9	pg/L	10.2	U	U
PCB-11	pg/L	29.4	B	UB
PCB-12/13	pg/L	10.2	U	U
PCB-14	pg/L	10.2	U	U
PCB-15	pg/L	10.2	U	U
PCB-16/32	pg/L	6.78		
PCB-17	pg/L	5.12	U	U
PCB-18	pg/L	9.05		
PCB-19	pg/L	5.12	U	U
PCB-20/21/33	pg/L	12.8		
PCB-22	pg/L	6.13		
PCB-23	pg/L	5.12	U	U
PCB-24/27	pg/L	5.38		
PCB-25	pg/L	5.12	U	U
PCB-26	pg/L	5.12	U	U
PCB-28	pg/L	9.33		
PCB-29	pg/L	5.12	U	U
PCB-30	pg/L	5.12	U	U
PCB-31	pg/L	13.7		
PCB-34	pg/L	5.12	U	U
PCB-35	pg/L	5.12	U	U
PCB-36	pg/L	5.12	U	U
PCB-37	pg/L	13.8		
PCB-38	pg/L	5.12	U	U
PCB-39	pg/L	5.12	U	U
PCB-40	pg/L	5.12	U	U
PCB-41/64/71/72	pg/L	6.74		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - PCB Congeners

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
PCB-42/59	pg/L	5.12	U	U
PCB-43/49	pg/L	5.83		
PCB-44	pg/L	5.55		
PCB-45	pg/L	5.12	U	U
PCB-46	pg/L	5.12	U	U
PCB-47	pg/L	5.12	U	U
PCB-48/75	pg/L	5.12	U	U
PCB-50	pg/L	5.12	U	U
PCB-51	pg/L	5.12	U	U
PCB-52/69	pg/L	7.27		
PCB-53	pg/L	5.12	U	U
PCB-54	pg/L	5.12	U	U
PCB-55	pg/L	5.12	U	U
PCB-56/60	pg/L	5.12	U	U
PCB-57	pg/L	5.12	U	U
PCB-58	pg/L	5.12	U	U
PCB-61/70	pg/L	8.35		
PCB-62	pg/L	5.12	U	U
PCB-63	pg/L	5.12	U	U
PCB-65	pg/L	5.12	U	U
PCB-67	pg/L	5.12	U	U
PCB-68	pg/L	5.12	U	U
PCB-73	pg/L	5.12	U	U
PCB-74	pg/L	6.86		
PCB-76/66	pg/L	7.26		
PCB-77	pg/L	3.76	U,*	U
PCB-78	pg/L	5.12	U	U
PCB-79	pg/L	5.12	U	U
PCB-80	pg/L	5.12	U	U
PCB-81	pg/L	1	U,*	U
PCB-82	pg/L	5.12	U	U
PCB-83	pg/L	5.12	U	U
PCB-84/92	pg/L	5.12	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - PCB Congeners

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
PCB-85/116	pg/L	5.12	U	U
PCB-86	pg/L	5.12	U	U
PCB-87/117/125	pg/L	5.12	U	U
PCB-88/91	pg/L	5.12	U	U
PCB-89	pg/L	5.12	U	U
PCB-90/101	pg/L	12.1		
PCB-93	pg/L	5.12	U	U
PCB-94	pg/L	5.12	U	U
PCB-95/98/102	pg/L	11.4		
PCB-96	pg/L	5.12	U	U
PCB-97	pg/L	5.61		
PCB-99	pg/L	9.47		
PCB-100	pg/L	5.12	U	U
PCB-103	pg/L	5.12	U	U
PCB-104	pg/L	5.12	U	U
PCB-105	pg/L	5.49		
PCB-106/118	pg/L	15.5		
PCB-107/109	pg/L	5.12	U	U
PCB-108/112	pg/L	5.12	U	U
PCB-110	pg/L	12.2		
PCB-111/115	pg/L	5.12	U	U
PCB-113	pg/L	5.12	U	U
PCB-114	pg/L	3.91	U,*	U
PCB-119	pg/L	5.12	U	U
PCB-120	pg/L	5.12	U	U
PCB-121	pg/L	5.12	U	U
PCB-122	pg/L	5.12	U	U
PCB-123	pg/L	2.62	U,*	U
PCB-124	pg/L	5.12	U	U
PCB-126	pg/L	2.68	U,*	U
PCB-127	pg/L	5.12	U	U
PCB-128/162	pg/L	5.12	U	U
PCB-129	pg/L	5.12	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - PCB Congeners

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
PCB-130	pg/L	5.12	U	U
PCB-131	pg/L	5.12	U	U
PCB-132/161	pg/L	5.12	U	U
PCB-133/142	pg/L	5.12	U	U
PCB-134/143	pg/L	5.12	U	U
PCB-135	pg/L	5.12	U	U
PCB-136	pg/L	5.12	U	U
PCB-137	pg/L	5.12	U	U
PCB-138/163/164	pg/L	18		
PCB-139/149	pg/L	11.1		
PCB-140	pg/L	5.12	U	U
PCB-141	pg/L	5.12	U	U
PCB-144	pg/L	5.12	U	U
PCB-145	pg/L	5.12	U	U
PCB-146/165	pg/L	5.12	U	U
PCB-147	pg/L	5.12	U	U
PCB-148	pg/L	5.12	U	U
PCB-150	pg/L	5.12	U	U
PCB-151	pg/L	5.12	U	U
PCB-152	pg/L	5.12	U	U
PCB-153	pg/L	18.6		
PCB-154	pg/L	5.12	U	U
PCB-155	pg/L	5.12	U	U
PCB-156	pg/L	9.73		
PCB-157	pg/L	4.58	J	J
PCB-158/160	pg/L	5.12	U	U
PCB-159	pg/L	5.12	U	U
PCB-166	pg/L	5.12	U	U
PCB-167	pg/L	3.57	U,*	U
PCB-168	pg/L	5.12	U	U
PCB-169	pg/L	1.37	U,*	U
PCB-170	pg/L	5.12	U	U
PCB-171	pg/L	5.12	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - PCB Congeners

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
PCB-172	pg/L	5.12	U	U
PCB-173	pg/L	5.12	U	U
PCB-174	pg/L	8.35		
PCB-175	pg/L	5.12	U	U
PCB-176	pg/L	5.12	U	U
PCB-177	pg/L	5.12	U	U
PCB-178	pg/L	5.12	U	U
PCB-179	pg/L	5.12	U	U
PCB-180	pg/L	24.9		
PCB-181	pg/L	5.12	U	U
PCB-182/187	pg/L	5.12	U	U
PCB-183	pg/L	5.89		
PCB-184	pg/L	5.12	U	U
PCB-185	pg/L	5.12	U	U
PCB-186	pg/L	5.12	U	U
PCB-188	pg/L	5.12	U	U
PCB-189	pg/L	2.98	U,*	U
PCB-190	pg/L	5.12	U	U
PCB-191	pg/L	5.12	U	U
PCB-192	pg/L	5.12	U	U
PCB-193	pg/L	5.12	U	U
PCB-194	pg/L	16.4		
PCB-195	pg/L	5.12	U	U
PCB-196/203	pg/L	5.12	U	U
PCB-197	pg/L	5.12	U	U
PCB-198	pg/L	5.12	U	U
PCB-199	pg/L	15.9		
PCB-200	pg/L	5.12	U	U
PCB-201	pg/L	5.12	U	U
PCB-202	pg/L	8.46		
PCB-204	pg/L	5.12	U	U
PCB-205	pg/L	5.12	U	U
PCB-206	pg/L	49.4		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - PCB Congeners

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
PCB-207	pg/L	5.72		
PCB-208	pg/L	13.6		
PCB-209	pg/L	1150		
Total monoCB	pg/L	22.2		
Total diCB	pg/L	29.4	B	UB
Total triCB	pg/L	77		
Total tetraCB	pg/L	47.9		
Total pentaCB	pg/L	71.7		
Total hexaCB	pg/L	62		
Total heptaCB	pg/L	39.2		
Total octaCB	pg/L	40.8		
Total nonaCB	pg/L	68.7		
Total decaCB	pg/L	1150		
Total PCB	pg/L	1610	B	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1290 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-48	LQ	VQ
2,3,7,8-TCDD	pg/L	58.6		
1,2,3,7,8-PeCDD	pg/L	2.1	U	U
1,2,3,4,7,8-HxCDD	pg/L	2.95	U	U
1,2,3,6,7,8-HxCDD	pg/L	3.58	U	U
1,2,3,7,8,9-HxCDD	pg/L	3.55	U	U
1,2,3,4,6,7,8-HpCDD	pg/L	2.76	U	U
OCDD	pg/L	118		
Total TCDD	pg/L	65.5		
Total PeCDD	pg/L	2.1	U	U
Total HxCDD	pg/L	3.58	U	U
Total HpCDD	pg/L	2.76	U	U
2,3,7,8-TCDF	pg/L	1.49	U	U
1,2,3,7,8-PeCDF	pg/L	1.96	U	U
2,3,4,7,8-PeCDF	pg/L	5.64	J	J
1,2,3,4,7,8-HxCDF	pg/L	62.4		
1,2,3,6,7,8-HxCDF	pg/L	8.04	J	J
1,2,3,7,8,9-HxCDF	pg/L	4.73	U	U
2,3,4,6,7,8-HxCDF	pg/L	2.73	EMPC	EMPC
1,2,3,4,6,7,8-HpCDF	pg/L	156		
1,2,3,4,7,8,9-HpCDF	pg/L	9.14	J	J
OCDF	pg/L	557		
Total TCDF	pg/L	7.68		
Total PeCDF	pg/L	37.3		
Total HxCDF	pg/L	114		
Total HpCDF	pg/L	181		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	71.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID:	PRR1WATCME-48				EPA Method 1613
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33785-001
Project:	PRR1290	Sample Size:	0.972 L	QC Batch No.:	4440
Date Collected:	16-May-12			Date Analyzed DB-5:	18-May-12
Time Collected:	0930				
				Date Received:	17-May-12
				Date Extracted:	17-May-12
				Date Analyzed DB-225:	NA

Analyte	Conc. (pg/L)	DL [a]	EMPC [b]	Qualifiers
2,3,7,8-TCDD	58.6			
1,2,3,7,8-PeCDD	ND	2.10		
1,2,3,4,7,8-HxCDD	ND	2.95		
1,2,3,6,7,8-HxCDD	ND	3.58		
1,2,3,7,8,9-HxCDD	ND	3.55		
1,2,3,4,6,7,8-HpCDD	ND	2.76		
OCDD	118			
2,3,7,8-TCDF	ND	1.49		
1,2,3,7,8-PeCDF	ND	1.96		
2,3,4,7,8-PeCDF	5.64			J
1,2,3,4,7,8-HxCDF	62.4			
1,2,3,6,7,8-HxCDF	8.04			J
2,3,4,6,7,8-HxCDF	ND		2.73	
1,2,3,7,8,9-HxCDF	ND	4.73		
1,2,3,4,6,7,8-HpCDF	156			
1,2,3,4,7,8,9-HpCDF	9.14			J
OCDF	557			

	Labeled Standard	%R	LCL-UCL [d]	Qualifiers
IS	13C-2,3,7,8-TCDD	72.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	64.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	73.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	66.6	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	68.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	67.6	23 - 140	
	13C-OCDD	68.7	17 - 157	
	13C-2,3,7,8-TCDF	74.4	24 - 169	
	13C-1,2,3,7,8-PeCDF	60.7	24 - 185	
	13C-2,3,4,7,8-PeCDF	62.1	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	62.2	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	62.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	63.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	60.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	60.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	67.1	26 - 138	
	13C-OCDF	62.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	97.5	35 - 197	

Totals			
Total TCDD	65.5		
Total PeCDD	ND	2.10	
Total HxCDD	ND	3.58	
Total HpCDD	ND	2.76	
Total TCDF	7.68		
Total PeCDF	37.3		
Total HxCDF	114		120
Total HpCDF	181		

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 69.2

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors (WHO)

Analyst: FEB

Approved By: Calvin Tanaka 22-May-2012 12:32

Sample ID:	PRR1WATCME-48			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33785-001	Date Received: 17-May-12
Project:	PRR1290	Sample Size: 0.977 L	QC Batch No.: 4441	Date Extracted: 17-May-12
Date Collected:	16-May-12	%Solids: 0.876	Date Analyzed DB-1 18-May-12	
Time Collected:	0930			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	9.70	5.12	
PCB-2	6.13	5.12	
PCB-3	6.41	5.12	
PCB-4/10	ND	10.2	
PCB-5/8	ND	10.2	
PCB-6	ND	10.2	
PCB-7/9	ND	10.2	
PCB-11	29.4	10.2	BUB
PCB-12/13	ND	10.2	
PCB-14	ND	10.2	
PCB-15	ND	10.2	
PCB-16/32	6.78	5.12	
PCB-17	ND	5.12	
PCB-18	9.05	5.12	
PCB-19	ND	5.12	
PCB-20/21/33	12.8	5.12	
PCB-22	6.13	5.12	
PCB-23	ND	5.12	
PCB-24/27	5.38	5.12	
PCB-25	ND	5.12	
PCB-26	ND	5.12	
PCB-28	9.33	5.12	
PCB-29	ND	5.12	
PCB-30	ND	5.12	
PCB-31	13.7	5.12	
PCB-34	ND	5.12	
PCB-35	ND	5.12	
PCB-36	ND	5.12	
PCB-37	13.8	5.12	
PCB-38	ND	5.12	
PCB-39	ND	5.12	
PCB-40	ND	5.12	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	6.74	5.12	
PCB-42/59	ND	5.12	
PCB-43/49	5.83	5.12	
PCB-44	5.55	5.12	
PCB-45	ND	5.12	
PCB-46	ND	5.12	
PCB-47	ND	5.12	
PCB-48/75	ND	5.12	
PCB-50	ND	5.12	
PCB-51	ND	5.12	
PCB-52/69	7.27	5.12	
PCB-53	ND	5.12	
PCB-54	ND	5.12	
PCB-55	ND	5.12	
PCB-56/60	ND	5.12	
PCB-57	ND	5.12	
PCB-58	ND	5.12	
PCB-61/70	8.35	5.12	
PCB-62	ND	5.12	
PCB-63	ND	5.12	
PCB-65	ND	5.12	
PCB-67	ND	5.12	
PCB-68	ND	5.12	
PCB-73	ND	5.12	
PCB-74	6.86	5.12	
PCB-76/66	7.26	5.12	
PCB-77	ND	3.76	+
PCB-78	ND	5.12	
PCB-79	ND	5.12	
PCB-80	ND	5.12	
PCB-81	ND	1.00	+
PCB-82	ND	5.12	

Sample ID:	PRR1WATCME-48			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33785-001	Date Received: 17-May-12
Project:	PRR1290	Sample Size: 0.977 L	QC Batch No.: 4441	Date Extracted: 17-May-12
Date Collected:	16-May-12	%Solids: 0.876	Date Analyzed DB-1 18-May-12	
Time Collected:	0930			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	5.12	
PCB-84/92	ND	5.12	
PCB-85/116	ND	5.12	
PCB-86	ND	5.12	
PCB-87/117/125	ND	5.12	
PCB-88/91	ND	5.12	
PCB-89	ND	5.12	
PCB-90/101	12.1	5.12	
PCB-93	ND	5.12	
PCB-94	ND	5.12	
PCB-95/98/102	11.4	5.12	
PCB-96	ND	5.12	
PCB-97	5.61	5.12	
PCB-99	9.47	5.12	
PCB-100	ND	5.12	
PCB-103	ND	5.12	
PCB-104	ND	5.12	
PCB-105	5.49	5.12	
PCB-106/118	15.5	5.12	
PCB-107/109	ND	5.12	
PCB-108/112	ND	5.12	
PCB-110	12.2	5.12	
PCB-111/115	ND	5.12	
PCB-113	ND	5.12	
PCB-114	ND	3.91	*
PCB-119	ND	5.12	
PCB-120	ND	5.12	
PCB-121	ND	5.12	
PCB-122	ND	5.12	
PCB-123	ND	2.62	*
PCB-124	ND	5.12	
PCB-126	ND	2.68	*

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	5.12	
PCB-128/162	ND	5.12	
PCB-129	ND	5.12	
PCB-130	ND	5.12	
PCB-131	ND	5.12	
PCB-132/161	ND	5.12	
PCB-133/142	ND	5.12	
PCB-134/143	ND	5.12	
PCB-135	ND	5.12	
PCB-136	ND	5.12	
PCB-137	ND	5.12	
PCB-138/163/164	18.0	5.12	
PCB-139/149	11.1	5.12	
PCB-140	ND	5.12	
PCB-141	ND	5.12	
PCB-144	ND	5.12	
PCB-145	ND	5.12	
PCB-146/165	ND	5.12	
PCB-147	ND	5.12	
PCB-148	ND	5.12	
PCB-150	ND	5.12	
PCB-151	ND	5.12	
PCB-152	ND	5.12	
PCB-153	18.6	5.12	
PCB-154	ND	5.12	
PCB-155	ND	5.12	
PCB-156	9.73	5.12	
PCB-157	4.58	5.12	J
PCB-158/160	ND	5.12	
PCB-159	ND	5.12	
PCB-166	ND	5.12	
PCB-167	ND	3.57	*

Sample ID:	PRR1WATCME-48		EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33785-001
Project:	PRR1290	Sample Size: 0.977 L	QC Batch No.: 4441
Date Collected:	16-May-12	%Solids: 0.876	Date Analyzed DB-1: 18-May-12
Time Collected:	0930		Date Received: 17-May-12
			Date Extracted: 17-May-12

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	5.12	
PCB-169	ND	1.37	*
PCB-170	ND	5.12	
PCB-171	ND	5.12	
PCB-172	ND	5.12	
PCB-173	ND	5.12	
PCB-174	8.35	5.12	
PCB-175	ND	5.12	
PCB-176	ND	5.12	
PCB-177	ND	5.12	
PCB-178	ND	5.12	
PCB-179	ND	5.12	
PCB-180	24.9	5.12	
PCB-181	ND	5.12	
PCB-182/187	ND	5.12	
PCB-183	5.89	5.12	
PCB-184	ND	5.12	
PCB-185	ND	5.12	
PCB-186	ND	5.12	
PCB-188	ND	5.12	
PCB-189	ND	2.98	*
PCB-190	ND	5.12	
PCB-191	ND	5.12	
PCB-192	ND	5.12	
PCB-193	ND	5.12	
PCB-194	16.4	5.12	
PCB-195	ND	5.12	
PCB-196/203	ND	5.12	
PCB-197	ND	5.12	
PCB-198	ND	5.12	
PCB-199	15.9	5.12	
PCB-200	ND	5.12	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	ND	5.12	
PCB-202	8.46	5.12	
PCB-204	ND	5.12	
PCB-205	ND	5.12	
PCB-206	49.4	5.12	
PCB-207	5.72	5.12	
PCB-208	13.6	5.12	
PCB-209	1150	5.12	
Total monoCB	22.2	5.12	
Total diCB	29.4	10.2	~~B~~ UB
Total triCB	77.0	5.12	
Total tetraCB	47.9	5.12	
Total pentaCB	71.7	5.12	
Total hexaCB	62.0	5.12	
Total heptaCB	39.2	5.12	
Total octaCB	40.8	5.12	
Total nonaCB	68.7	5.12	
Total decaCB	1150	5.12	
Total PCB	1610	10.2	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: 0.00106

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Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33785 0.4°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1290	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-48	5/16/2012	9:30	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins (17 isomers) and Total PCDD/PCDFs
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Refer to RAWP QAPP WS 15-4 for Effluent Samples

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kayon Gandhi	05/16/12		5/17/12 0802 Bethany Bendict			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1297 (200-10886)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17529R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1297 (200-10886) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-22-SP-105	200-10886-1	Water	5/19/2012		X				
PRR1WATGACE-22-SP-106	200-10886-2	Water	5/19/2012		X				
PRR1WATGACE-22-SP-109	200-10886-3	Water	5/19/2012		X				
PRR1WATCME-51	200-10886-4	Water	5/19/2012						X
PRR1WAT-22-SP-101	200-10886-5	Water	5/19/2012						X
TB05192012	200-10886-6	Water	5/19/2012		X				
PRR1WATCME-49	200-10886-7	Water	5/19/2012						X
PRR1WATCME-50	200-10886-8	Water	5/19/2012						X

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-22-SP-105	Chlorobenzene	920 E	930 D	930 D
PRR1WATGACE-22-SP-106	Chlorobenzene	2100 E	1500 D	1500 D
PRR1WATGACE-22-SP-109	Chlorobenzene	1600 E	1500 D	1500 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 13, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1297 - VOCs

ANALYTE	Units	PRR1WATGACE-22-SP-106	LQ	VQ	PRR1WATGACE-22-SP-109	LQ	VQ	PRR1WATGACI-22-SP-105	LQ	VQ
2-Butanone	ug/L	89			22	J	J	8	J	J
Chlorobenzene	ug/L	1500	D	D	1500	D	D	930	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1297 - Miscellaneous

ANALYTE	Units	PRR1WAT-22-SP-101	LQ	VQ	PRR1WATCME-49	LQ	VQ	PRR1WATCME-50	LQ	VQ
Total Suspended Solids	mg/L	23.6			4			6.4		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1297 - Miscellaneous

ANALYTE	Units	PRR1WATCME-51	LQ	VQ
Total Suspended Solids	mg/L	7.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-22-SP-1

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 15.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	89	
108-90-7	Chlorobenzene	1500 2100	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-22-SP-1DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 115.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	81	J D
108-90-7	Chlorobenzene	1500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-22-SP-1

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB19.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 12.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	22	J
108-90-7	Chlorobenzene	1500 ~~1600~~	E ~~D~~

Report 1,4-Dioxane for Low-Medium VOA analysis only

EPA SAMPLE NO.
PRR1WATGACE-22-SP-1DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 89.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	450	U
108-90-7	Chlorobenzene	1500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-22-SP-1

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 8.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	8.0	J
108-90-7	Chlorobenzene	930 ~~920~~	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-22-SP-1DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 60.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	300	U
108-90-7	Chlorobenzene	930	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05192012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1297

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10886-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINB21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/21/2012

% Moisture: not dec. Date Analyzed: 05/21/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.089	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-51
Lab Sample ID: 200-10886-4
Lab Name: TestAmerica Burlington
Job No.: 200-10886-2
SDG ID.: PRR1297
Matrix: Water
Date Sampled: 05/19/2012 08:35
Reporting Basis: WET
Date Received: 05/21/2012 08:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	7.2	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-22-SP-101
Lab Sample ID: 200-10886-5
Lab Name: TestAmerica Burlington
Job No.: 200-10886-2
SDG ID.: PRR1297
Matrix: Water
Date Sampled: 05/19/2012 08:30
Reporting Basis: WET
Date Received: 05/21/2012 08:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	23.6	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-49 Lab Sample ID: 200-10886-7

Lab Name: TestAmerica Burlington Job No.: 200-10886-2

SDG ID.: PRR1297

Matrix: Water Date Sampled: 05/19/2012 08:35

Reporting Basis: WET Date Received: 05/21/2012 08:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	4.0	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-50 Lab Sample ID: 200-10886-8

Lab Name: TestAmerica Burlington Job No.: 200-10886-2

SDG ID.: PRR1297

Matrix: Water Date Sampled: 05/19/2012 20:00

Reporting Basis: WET Date Received: 05/21/2012 08:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.4	1.0		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1297	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-22-SP-105	5/19/2012	0830	water	Grab	3	X																	
PRR1WATGACE-22-SP-106	5/19/2012	0830	water	Grab	3	X																	
PRR1WATGACE-22-SP-109	5/19/2012	0830	water	Grab	3	X																	
PRR1WATCME-51	5/19/2012	0835	water	Grab	1		X																
PRR1WAT-22-SP-101	5/19/2012	0830	water	Grab	1		X																
TB05192012	5/19/2012	———	water	Grab	3	X																	
PRR1WATCME-49	5/17/2012	0835	water	Grab	1		X																
PRR1WATCME-50	5/18/2012	2000	water	Grab	1		X																

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 5-8°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
MATT McLEOD	05/19/12	0845	Kavin Gandhi			
Kavin Gandhi	05/19/12	1030	0800 5/21/12			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1300 (200-10897)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17532R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1300 (200-10897) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-23-SP-105	200-10897-1	Water	5/21/2012		X				
PRR1WATGACE-23-SP-106	200-10897-2	Water	5/21/2012		X				
PRR1WATGACE-23-SP-109	200-10897-3	Water	5/21/2012		X				
PRR1WATCME-52	200-10897-4	Water	5/21/2012						X
PRR1WAT-23-SP-101	200-10897-5	Water	5/21/2012						X
TB05212012	200-10897-6	Water	5/21/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-23-SP-105	Chlorobenzene	2000 E	1700 D	1700 D
PRR1WATGACE-23-SP-106	Chlorobenzene	1600 E	1400 D	1400 D
PRR1WATGACE-23-SP-109	Chlorobenzene	400 E	350 D	350 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 13, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1300 - VOCs

ANALYTE	Units	PRR1WATGACE-23-SP-106	LQ	VQ	PRR1WATGACE-23-SP-109	LQ	VQ	PRR1WATGACI-23-SP-105	LQ	VQ
2-Butanone	ug/L	110			7.8	J	J	76	U	U
Chlorobenzene	ug/L	1400	D	D	350	D	D	1700	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1300 - Miscellaneous

ANALYTE	Units	PRR1WAT-23-SP-101	LQ	VQ	PRR1WATCME-52	LQ	VQ
Total Suspended Solids	mg/L	39.6			3.3		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-23-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ19.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 15.2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	76	U
108-90-7	Chlorobenzene	1700 ~~2000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-23-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 107.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	540	U
108-90-7	Chlorobenzene	1700	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-23-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 11.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	110	
108-90-7	Chlorobenzene	1400 ~~1600~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACI-23-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ21.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 84.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	130	J D
108-90-7	Chlorobenzene	1400	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-23-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ25.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	7.8	J
108-90-7	Chlorobenzene	350 ~~400~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-23-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TARVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ24.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 22.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	110	U
108-90-7	Chlorobenzene	350	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05212012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1300

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10897-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: JDJJ27.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/22/2012

% Moisture: not dec. Date Analyzed: 05/22/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-52 Lab Sample ID: 200-10897-4

Lab Name: TestAmerica Burlington Job No.: 200-10897-2

SDG ID.: PRR1300

Matrix: Water Date Sampled: 05/21/2012 10:28

Reporting Basis: WET Date Received: 05/22/2012 08:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	3.3	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-23-SP-101 Lab Sample ID: 200-10897-5

Lab Name: TestAmerica Burlington Job No.: 200-10897-2

SDG ID.: PRR1300

Matrix: Water Date Sampled: 05/21/2012 10:40

Reporting Basis: WET Date Received: 05/22/2012 08:50

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	39.6	1.9		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1300	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-23-SP-105	5/21/2012	1038	water	Grab	3	X																	
PRR1WATGACE-23-SP-106	5/21/2012	1033	water	Grab	3	X																	
PRR1WATGACE-23-SP-109	5/21/2012	1036	water	Grab	3	X																	
PRR1WATCME-52	5/21/2012	1028	water	Grab	1		X																
PRR1WAT-23-SP-101	5/21/2012	1040	water	Grab	1		X																
TB05212012	5/21/2012		water	Grab	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	5/21/12	1330	[signature] 5/22/12 DESO TABOR			
[signature]	05/21/12	1500				

05/24/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1303 (200-10925)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17535R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1303 (200-10925) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-24-SP-105	200-10925-1	Water	5/22/2012		X				
PRR1WATGACE-24-SP-106	200-10925-2	Water	5/22/2012		X				
PRR1WATGACE-24-SP-109	200-10925-3	Water	5/22/2012		X				
PRR1WATCME-53	200-10925-4	Water	5/22/2012						X
PRR1WAT-24-SP-101	200-10925-5	Water	5/22/2012						X
TB05222012	200-10925-6	Water	5/22/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-24-SP-105	Chlorobenzene	2200 E	1900 D	1900 D
PRR1WATGACE-24-SP-106	Chlorobenzene	1500 E	1400 D	1400 D
PRR1WATGACE-24-SP-109	Chlorobenzene	2000 E	3300 D	3300 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 13, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1303 - VOCs

ANALYTE	Units	PRR1WATGACE-24-SP-106	LQ	VQ	PRR1WATGACE-24-SP-109	LQ	VQ	PRR1WATGACI-24-SP-105	LQ	VQ
2-Butanone	ug/L	81	J	J	32	J	J	17	J	J
Chlorobenzene	ug/L	1900	D	D	1400	D	D	3300	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1303 - Miscellaneous

ANALYTE	Units	PRR1WAT-24-SP-101	LQ	VQ	PRR1WATCME-53	LQ	VQ
Total Suspended Solids	mg/L	37.8			6.3		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-24-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1303

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10925-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINE11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/23/2012

% Moisture: not dec. Date Analyzed: 05/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 20.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	81	J
108-90-7	Chlorobenzene	1900 ~~2200~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-24-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1303

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10925-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINE10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/23/2012

% Moisture: not dec. Date Analyzed: 05/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 141.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	88	J D
108-90-7	Chlorobenzene	1900	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-24-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1303

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10925-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINE14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/23/2012

% Moisture: not dec. Date Analyzed: 05/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 13.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	32	J
108-90-7	Chlorobenzene	1400 ~~1500~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-24-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1303

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10925-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINE13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/23/2012

% Moisture: not dec. Date Analyzed: 05/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 95.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	41	J D
108-90-7	Chlorobenzene	1400	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-24-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: . SDG No.: PRR1303

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10925-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINE08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/23/2012

% Moisture: not dec. Date Analyzed: 05/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 33.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	17	J
108-90-7	Chlorobenzene	3300 ~~2000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-24-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1303

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10925-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DINE07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/23/2012

% Moisture: not dec. Date Analyzed: 05/23/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 244.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1200	U
108-90-7	Chlorobenzene	3300	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-53 Lab Sample ID: 200-10925-4

Lab Name: TestAmerica Burlington Job No.: 200-10925-2

SDG ID.: PRR1303

Matrix: Water Date Sampled: 05/22/2012 08:35

Reporting Basis: WET Date Received: 05/23/2012 09:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	6.3	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-24-SP-101 Lab Sample ID: 200-10925-5

Lab Name: TestAmerica Burlington Job No.: 200-10925-2

SDG ID.: PRR1303

Matrix: Water Date Sampled: 05/22/2012 08:47

Reporting Basis: WET Date Received: 05/23/2012 09:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	37.8	1.9		mg/L			1	SM 2540D

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1303	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-24-SP-105	5/22/2012	0845	water	Grab	3	X																	
PRR1WATGACE-24-SP-106	5/22/2012	0843	water	Grab	3	X																	
PRR1WATGACE-24-SP-109	5/22/2012	0840	water	Grab	3	X																	
PRR1WATCME-53	5/22/2012	0835	water	Grab	1		X																
PRR1WAT-24-SP-101	5/22/2012	0847	water	Grab	1		X																
TB05222012	5/22/2012		water	Grab	3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 3.0

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	5/22/12	1230	[signature] 5/23/12 TABSR 0920			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig L. Brown	5/22/12	1500				
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/24/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1306 (200-10949)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17538R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1306 (200-10949) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-54	200-10949-1	Water	5/23/2012		X	X	X	X	X
PRR1WATCMI-54	200-10949-2	Water	5/23/2012		X	X	X		
TB05232012	200-10949-3	Water	5/23/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. SVOC – Semivolatile Organic Compounds by USEPA Method SOM0.1.2
3. PEST/PCB – Pesticides and PCBs by USEPA Method SOM01.2, and Chlorinated Herbicides by USEPA SW846 Method 8151A
4. MET - Metals by USEPA Method ISM01.2
5. MISC – Total Suspended Solids (TSS) by Standard Methods (SM) 2540D, Total Organic Carbon (TOC) by SM 5310B, and Cyanide by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The carbon tetrachloride result for sample location PRR1WATCME-54 was qualified as not detected due to detection of the compound in the associated blanks. See Section 2, Blank Contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	Carbon tetrachloride	Detected sample results > MDL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCME-54	Methylene chloride	48 E	55 D	55 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results were qualified as not detected due to detections of the compounds in the associated blanks. See Section 2, Blank Contamination.

Several results for sample location PRR1WATCME-54 were qualified as estimated due to the associated surrogates being diluted below the detection limit. See Section 3, Surrogates.

Several sample results for sample location PRR1WATCMI-54 were qualified as estimated because several surrogate recoveries could not be determined due to sample dilution. See Section 3, Surrogates.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	Phenol Di-n-butylphthalate	Detected sample results > MDL and < BAL	"UB" at the RL

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	Butylbenzylphthalate bis(2-Ethylhexyl)phthalate	Detected sample results > MDL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique. Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Location	Surrogate	Recovery
PRR1WATCMI-54	Phenol-d5 Bis-(2-chloroethyl) ether-d8 2-Chlorophenol-d4 4-Methylphenol-d8 Nitrobenzene-d5 2-Nitrophenol-d4 Dimethylphthalate-d6 4-Nitrophenol-d4 Fluorene-d10 4,6-Dinitro-2-methylphenol-d2 Anthracene-d10 Pyrene-d10 Benzo(a)pyrene-d12	AC
	2,4-Dichlorophenol-d3 4-Chloroaniline-d4 Acenaphthylene-d8	D

D Diluted
AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of surrogate deviations, 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
Surrogates diluted below the calibration curve	Non-detect	J[1]
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

Several detected pesticides exhibited results that exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 6, Reporting.

The sample results for sample location PRR1WATCMI-54 were qualified as estimated because the TCMX surrogate recovery could not be determined due to sample dilution. See Section 3, Surrogates.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during pesticides analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. 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 Location	Analyte	Sample Result	Qualification
PRR1WATCME-54	gamma-BHC Endrin aldehyde gamma-Chlordane	Detected sample results < RL and < BAL	"UB" at the RL
	beta-BHC	Detected sample results > RL and < BAL	"UB" at detected sample concentration

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique. Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Location	Surrogate	Recovery
PRR1WATCMI-54	Decachlorobiphenyl	AC
	Tetrachloro-m-xylene	D

D Diluted
AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of surrogate deviations, 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
Surrogates diluted below the calibration curve	Non-detect	J[1]
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCME-54	4,4'-DDT	0.27 E	0.23 D	0.23 D
PRR1WATCMI-54	4,4'-DDD	3.3 E	2.7 D	2.7 D
	4,4'-DDT	2.9 E	3.7 D	3.7 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

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 Location	Compound	%D
PRR1WATCME-54	2,4'-DDE	413.5 %
	2,4'-DDD	37.0 %
	alpha-BHC	178.0 %
	Heptachlor	999.9 %
	delta-BHC	33.9 %
	Aldrin	999.9 %
	Endosulfan I	999.9 %
	Endrin	345.0 %
	Endosulfan sulfate	999.9 %
	alpha-Chlordane	982.0 %
PRR1WATCMI-54	4,4'-DDD	272.8 %
	4,4'-DDT	78.7 %
	delta-BHC	999.9 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blanks or field blank at or above the PQL during PCB analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The 2,4,5-T result for sample location PRR1WATCMI-54 was qualified as estimated due to the surrogate being diluted below the detection limit. See Section 3, Surrogates.

The 2,4-DB result for sample location PRR1WATCME-54 was qualified as not detected because it exhibited a percent difference between the primary and confirmation columns that exceeded the control limit. The sample results are evaluated in section 7, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during herbicides analysis.

3. SURROGATES

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.

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

Sample Location	Surrogate	Recovery
PRR1WATCMI-54	2,4-Dichlorophenylacetic acid	D

D Diluted

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
Surrogates diluted below the calibration curve	Non-detect	UJ[1]
	Detect	J[1]

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. 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 Location	Compound	%D
PRR1WATCME-54	2,4-DB	99.5 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.

Qualifier	Description
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The lead and silver results for sample location PRR1WATCME-54 were qualified as not detected due to blank contamination. See Section 2, Blank Contamination.

The arsenic and zinc results for sample location PRR1WATCME-54 may have a high bias due to LCS recoveries that were greater than the upper control limit. See Section 3, Laboratory Control Sample.

The nickel and selenium results for sample location PRR1WATCME-54 were qualified as estimated due to serial dilution percent difference exceedances. See section 6, Serial Dilution.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during metals analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results associated with QA blank contamination that were greater than the BAL did not require qualification. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1WATCME-54	Lead Silver	Detected sample results < RL and < BAL	"UB" at the RL

RL = reporting limit

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. All LCS recoveries were within the control limits, with the exception of the analytes associated with sample locations, as presented in the following table.

Sample Location	Analyte	LCS Recovery
PRR1WATCME-54	Arsenic	127%
	Cadmium	126%
	Lead	124%
	Zinc	133%

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

Control limit	Sample Result	Qualification
LCS percent recovery 50% to 79%	Non-detect	UJ
	Detect	J
LCS percent recovery < 50%	Non-detect	R
	Detect	J
LCS percent recovery > 120%	Non-detect	No Action
	Detect	J

4. MATRIX SPIKE (MS)

The MS analysis is performed to determine the accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify

data. A control limit of 20% for water matrices and 35% for soil matrices is applied to concentrations that are at least five times the reporting limit (RL). 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 analysis was not performed on a sample location from within this SDG.

6. 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.

Sample location PRR1WATCME-54 was used in the serial dilution analysis. All serial dilutions were within the control limits, with the exception of the analyte presented in the following table. The nickel result for the diluted sample was greater than the nickel result for the undiluted sample.

Sample Location	Analyte	Serial Dilution (%D)
PRR1WATCME-54	Nickel	12 %
	Selenium	42 %

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. The qualifications are applied to all sample results associated with this analytical batch.

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

7. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

11. Overall Assessment

Overall 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.

CYANIDE, TSS, AND TOC DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. Analytes were detected in the associated QA blanks; however, the associated sample results were greater than the BAL 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCS analyses were performed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x) dilution in order to bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL

Qualifier	Description
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY:	Dennis Dyke Project Scientist
SIGNATURE:	
DATE:	October 14, 2012
PEER REVIEW:	Joseph C. Houser
DATE:	October 18, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - PCBs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ
Aroclor-1016	ug/L	1	U	U
Aroclor-1221	ug/L	1	U	U
Aroclor-1232	ug/L	1	U	U
Aroclor-1242	ug/L	1	U	U
Aroclor-1248	ug/L	1	U	U
Aroclor-1254	ug/L	1	U	U
Aroclor-1260	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Pesticides

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,4'-DDD	ug/L	0.018	P	J	2.7	P D	JND
2,4'-DDE	ug/L	0.01	J P	U	1.2	P	JN
2,4'-DDT	ug/L	0.054			3.7	P D	JND
4,4'-DDD	ug/L	0.053			NA		
4,4'-DDE	ug/L	0.018			NA		
4,4'-DDT	ug/L	0.23	D	D	NA		
Aldrin	ug/L	0.005	J P	U	NA		
Alpha-BHC	ug/L	0.005	J P B	U	NA		
Alpha-Chlordane	ug/L	0.005	J P	U	NA		
Beta-BHC	ug/L	0.028	B	UB	NA		
Delta-BHC	ug/L	0.016	P B	J	0.48	J P B	U
Dieldrin	ug/L	0.01	U	U	NA		
Endosulfan I	ug/L	0.005	J P	U	NA		
Endosulfan II	ug/L	0.011			NA		
Endosulfan Sulfate	ug/L	0.01	J P	U	NA		
Endrin	ug/L	0.01	J P	U	NA		
Endrin Aldehyde	ug/L	0.01	J P B	UB	NA		
Gamma-BHC (Lindane)	ug/L	0.005	J P	UB	NA		
Gamma-Chlordane	ug/L	0.005	J P B	UB	NA		
Heptachlor	ug/L	0.005	J P B	U	NA		
Heptachlor Epoxide	ug/L	0.0083			NA		
Toxaphene	ug/L	0.5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Herbicides

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,4,5-T	ug/L	2.6			3100		J
2,4-D	ug/L	11			NA		
2,4-DB	ug/L	1.8	J p	U	NA		
Dinoseb	ug/L	0.99	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - VOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	25		
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	0.9	J	J	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	27			39	J	J
Acrolein	ug/L	20	U	U	NA		
Acrylonitrile	ug/L	20	U	U	NA		
Benzene	ug/L	0.77	J	J	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	J B	UB	NA		
Chlorobenzene	ug/L	3.4			NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	6.5			NA		
Chloromethane	ug/L	0.24	J	J	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	55	B D	D	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	0.023	J	J	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - VOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - SVOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.9	U	U	NA		
2,4,5-Trichlorophenol	ug/L	4.9	U	UJ	1200		
2,4,6-Trichlorophenol	ug/L	0.095	J	J	NA		
2,4-Dichlorophenol	ug/L	4.9	U	UJ	NA		
2,4-Dimethylphenol	ug/L	4.9	U	U	NA		
2,4-Dinitrophenol	ug/L	9.9	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.9	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.9	U	U	NA		
2-Chlorophenol	ug/L	0.6	J	J	NA		
2-Nitrophenol	ug/L	4.9	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.9	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.9	U	U	210	U	U
4-Nitrophenol	ug/L	9.9	U	U	NA		
Anthracene	ug/L	4.9	U	U	NA		
Benzidine	ug/L	9.9	U	U	NA		
Benzo(a)anthracene	ug/L	4.9	U	U	NA		
Benzo(a)pyrene	ug/L	4.9	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.9	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.9	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.9	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	4.9	J B	UB	NA		
Butylbenzylphthalate	ug/L	4.9	J B	UB	NA		
Chrysene	ug/L	4.9	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.9	U	U	NA		
Diethylphthalate	ug/L	4.9	U	U	NA		
Dimethylphthalate	ug/L	4.9	U	U	NA		
Di-n-Butylphthalate	ug/L	4.9	J B	UB	NA		
Fluoranthene	ug/L	4.9	U	U	NA		
Fluorene	ug/L	4.9	U	U	NA		
Hexachlorobenzene	ug/L	4.9	U	U	NA		
Hexachlorobutadiene	ug/L	4.9	U	UJ	NA		
Hexachlorocyclopentadiene	ug/L	4.9	U	UJ	NA		
Hexachloroethane	ug/L	4.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - SVOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.9	U	U	NA		
Isophorone	ug/L	4.9	U	U	NA		
Naphthalene	ug/L	4.9	U	UJ	NA		
Nitrobenzene	ug/L	4.9	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.9	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.9	U	U	NA		
Pentachlorophenol	ug/L	9.9	U	UJ	NA		
Phenanthrene	ug/L	4.9	U	U	NA		
Phenol	ug/L	4.9	J B	UB	NA		
Pyrene	ug/L	4.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Inorganics

ANALYTE	Units	PRR1WATCME-54	LQ	VQ
Antimony	ug/L	12.9		
Arsenic	ug/L	7.7		J
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	1.7	J	J
Copper	ug/L	3.4		
Cyanide	ug/L	2.7	J	J
Lead	ug/L	1	J	UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	10.8	E	J
Selenium	ug/L	13.2	E	J
Silver	ug/L	1	J	UB
Zinc	ug/L	14.2		J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Miscellanous

ANALYTE	Units	PRR1WATCME-54	LQ	VQ
Total Organic Carbon	mg/L	5.9	B	
Total Suspended Solids	mg/L	2.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1306
Matrix: WATER Lab Sample Id: 200-10949-1
% Solids: Date Received: 05/24/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	12.9			MS
7440-38-2	Arsenic	7.7		J	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	1.7	J		MS
7440-50-8	Copper	3.4			MS
7439-92-1	Lead	1.0 ~~0.82~~	~~J~~	UB	MS
7440-02-0	Nickel	10.8		~~E~~ J	MS
7782-49-2	Selenium	13.2		~~E~~ J	MS
7440-22-4	Silver	1.0 ~~0.062~~	~~J~~	UB	MS
7440-66-6	Zinc	14.2		J	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1306
Matrix: WATER Lab Sample Id: 200-10949-1
% Solids: Date Received: 05/24/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1306
Matrix: WATER Lab Sample Id: 200-10949-1
% Solids: Date Received: 05/24/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	2.7	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.24	J
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	55 ~~48~~	~~E B~~ D
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	27	
67-66-3	Chloroform	6.5	
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0 ~~0.029~~	~~J B~~ UB
71-43-2	Benzene	0.77	J
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	0.90	J
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	0.023	J
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	3.4	
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.33	J D
75-01-4	Vinyl chloride	1.7	U
74-83-9	Bromomethane	1.7	U
75-00-3	Chloroethane	1.7	U
107-02-8	Acrolein	34	U
75-35-4	1,1-Dichloroethene	1.7	U
75-09-2	Methylene chloride	55	B D
107-13-1	Acrylonitrile	34	U
156-60-5	trans-1,2-Dichloroethene	1.7	U
75-34-3	1,1-Dichloroethane	1.7	U
78-93-3	2-Butanone	33	D
67-66-3	Chloroform	7.6	D
71-55-6	1,1,1-Trichloroethane	1.7	U
56-23-5	Carbon tetrachloride	0.053	J B D
71-43-2	Benzene	0.93	J D
107-06-2	1,2-Dichloroethane	1.7	U
79-01-6	Trichloroethene	1.7	U
78-87-5	1,2-Dichloropropane	1.7	U
75-27-4	Bromodichloromethane	1.7	U
10061-01-5	cis-1,3-Dichloropropene	1.7	U
108-88-3	Toluene	0.039	J B D
10061-02-6	trans-1,3-Dichloropropene	1.7	U
79-00-5	1,1,2-Trichloroethane	1.7	U
127-18-4	Tetrachloroethene	1.7	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.7	U
108-90-7	Chlorobenzene	4.1	B D
100-41-4	Ethylbenzene	1.7	U
75-25-2	Bromoform	1.7	U
79-34-5	1,1,2,2-Tetrachloroethane	1.7	U
541-73-1	1,3-Dichlorobenzene	1.7	U
106-46-7	1,4-Dichlorobenzene	1.7	U
95-50-1	1,2-Dichlorobenzene	1.7	U
120-82-1	1,2,4-Trichlorobenzene	1.7	U
87-61-6	1,2,3-Trichlorobenzene	1.7	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB24.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 15.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	39	J
87-61-6	1,2,3-Trichlorobenzene	25	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05232012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB26.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/26/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.038	J B
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.015	J B
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05232012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB26.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/26/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.31	J
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: RJZWR05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/31/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.9	U
108-95-2	Phenol	4.9 ~~0.89~~	~~J B~~ UB
111-44-4	Bis(2-chloroethyl)ether	4.9	U
95-57-8	2-Chlorophenol	0.60	J
108-60-1	2,2'-Oxybis(1-chloropropane)	4.9	U
67-72-1	Hexachloroethane	4.9	U
98-95-3	Nitrobenzene	4.9	U
78-59-1	Isophorone	4.9	U
88-75-5	2-Nitrophenol	4.9	U
105-67-9	2,4-Dimethylphenol	4.9	U
120-83-2	2,4-Dichlorophenol	4.9	U J
91-20-3	Naphthalene	4.9	U J
87-68-3	Hexachlorobutadiene	4.9	U J
77-47-4	Hexachlorocyclopentadiene	4.9	U J
88-06-2	2,4,6-Trichlorophenol	0.095	J
95-95-4	2,4,5-Trichlorophenol	4.9	U J
131-11-3	Dimethylphthalate	4.9	U
606-20-2	2,6-Dinitrotoluene	4.9	U
51-28-5	2,4-Dinitrophenol	9.9	U
100-02-7	4-Nitrophenol	9.9	U
121-14-2	2,4-Dinitrotoluene	4.9	U
84-66-2	Diethylphthalate	4.9	U
86-73-7	Fluorene	4.9	U
534-52-1	4,6-Dinitro-2-methylphenol	9.9	U
86-30-6	N-Nitrosodiphenylamin [1]	4.9	U
118-74-1	Hexachlorobenzene	4.9	U
87-86-5	Pentachlorophenol	9.9	U J
85-01-8	Phenanthrene	4.9	U
120-12-7	Anthracene	4.9	U
84-74-2	Di-n-butylphthalate	4.9 ~~0.16~~	~~J B~~ UB
206-44-0	Fluoranthene	4.9	U
92-87-5	Benzidine	9.9	U
129-00-0	Pyrene	4.9	U

1E - FORM I SV-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: RJZWR05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/31/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.9 ~~0.14~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.9	U J
56-55-3	Benzo(a)anthracene	4.9	U
218-01-9	Chrysene	4.9	U
117-81-7	Bis(2-ethylhexyl)phthalate	4.9 ~~0.22~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	4.9	U
207-08-9	Benzo(k)fluoranthene	4.9	U
50-32-8	Benzo(a)pyrene	4.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.9	U
53-70-3	Dibenzo(a,h)anthracene	4.9	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 970 (g/mL) mL Lab File ID: RJZWR07.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/31/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	1200	
534-52-1	4,6-Dinitro-2-methylphenol	210	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 25MAY121434-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.010 ~~0.0035~~	~~J P~~ U
789-02-6	2,4'-DDT	0.054	
53-19-0	2,4'-DDD	0.018	~~P~~ J

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 25MAY121640-R031.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q	
319-84-6	alpha-BHC	0.0050 ~~0.00011~~	~~J P B~~	U
319-85-7	beta-BHC	0.028 ~~0.028~~	~~B~~	UB
319-86-8	delta-BHC	0.016 ~~0.016~~	~~P B~~	U J
58-89-9	gamma-BHC (Lindane)	0.0050 ~~0.00036~~	~~J P~~	UB
76-44-8	Heptachlor	0.0050 ~~0.00017~~	~~J P B~~	U
309-00-2	Aldrin	0.0050 ~~0.00080~~	~~J P~~	U
1024-57-3	Heptachlor epoxide	0.0083		
959-98-8	Endosulfan I	0.0050 ~~0.00067~~	~~J P~~	U
60-57-1	Dieldrin	0.010	U	
72-55-9	4,4'-DDE	0.018		
72-20-8	Endrin	0.010 ~~0.0016~~	~~J P~~	U
33213-65-9	Endosulfan II	0.011		
72-54-8	4,4'-DDD	0.053		
1031-07-8	Endosulfan sulfate	0.010 ~~0.000090~~	~~J P~~	U
50-29-3	4,4'-DDT	0.23 ~~0.27~~	~~E~~ D	
7421-93-4	Endrin aldehyde	0.010 ~~0.0011~~	~~J P B~~	UB
5103-71-9	alpha-Chlordane	0.0050 ~~0.0010~~	~~J P~~	U
5103-74-2	gamma-Chlordane	0.0050 ~~0.00021~~	~~J P B~~	UB
8001-35-2	Toxaphene	0.50	U	

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 29MAY121422-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/29/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.00023	J P D B
319-85-7	beta-BHC	0.030	D B
319-86-8	delta-BHC	0.017	P D B
58-89-9	gamma-BHC (Lindane)	0.00030	J P D
76-44-8	Heptachlor	0.00017	J P D B
309-00-2	Aldrin	0.00088	J P D
1024-57-3	Heptachlor epoxide	0.0086	J D
959-98-8	Endosulfan I	0.00067	J P D
60-57-1	Dieldrin	0.030	U
72-55-9	4,4'-DDE	0.017	J D
72-20-8	Endrin	0.0017	J P D
33213-65-9	Endosulfan II	0.011	J D
72-54-8	4,4'-DDD	0.048	D
1031-07-8	Endosulfan sulfate	0.030	U
50-29-3	4,4'-DDT	0.23	D
7421-93-4	Endrin aldehyde	0.0012	J P D B
5103-71-9	alpha-Chlordane	0.0010	J P D
5103-74-2	gamma-Chlordane	0.00077	J P D B
8001-35-2	Toxaphene	1.5	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 25MAY121434-R091.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	1.2	~~P~~ JN
53-19-0	2,4'-DDD	2.7 ~~3.3~~	~~E P~~ JND
789-02-6	2,4'-DDT	3.7 ~~2.9~~	~~E P~~ JND

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 25MAY121434-R081.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.99	P D
53-19-0	2,4'-DDD	2.7	P D
789-02-6	2,4'-DDT	3.7	P D

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 25MAY121640-R071.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.48 ~~0.16~~	~~J P B~~ U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 985 (g/mL) mL Lab File ID: 25MAY121455-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/26/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I

HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCME-54 Lab Sample ID: 200-10949-1

Matrix: Water Lab File ID: 30may121001-r051.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:30

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 960(mL) Date Analyzed: 05/30/2012 12:42

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	11		2.0	0.68
94-82-6	2,4-DB	1.8 ~~0.67~~	~~J p~~ U	1.8	0.49
88-85-7	Dinoseb	0.99	U	0.99	0.20
93-76-5	2,4,5-T	2.6		0.49	0.14

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	110		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCME-54 Lab Sample ID: 200-10949-1

Matrix: Water Lab File ID: 30may121001-r051.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:30

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 960(mL) Date Analyzed: 05/30/2012 12:42

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	88		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCMI-54 Lab Sample ID: 200-10949-2

Matrix: Water Lab File ID: 30may121001-r061.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:45

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 1035(mL) Date Analyzed: 05/30/2012 13:10

Con. Extract Vol.: 10000(uL) Dilution Factor: 500

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	3100	J	230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCMI-54 Lab Sample ID: 200-10949-2

Matrix: Water Lab File ID: 30may121001-r061.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:45

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 1035(mL) Date Analyzed: 05/30/2012 13:10

Con. Extract Vol.: 10000(uL) Dilution Factor: 500

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-54 | Lab Sample ID: 200-10949-1

Lab Name: TestAmerica Burlington | Job No.: 200-10949-2

SDG ID.: PRR1306

Matrix: Water | Date Sampled: 05/23/2012 11:30

Reporting Basis: WET | Date Received: 05/24/2012 08:15

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	5.9	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-54 Lab Sample ID: 200-10949-1

Lab Name: TestAmerica Burlington Job No.: 200-10949-3

SDG ID.: PRR1306

Matrix: Water Date Sampled: 05/23/2012 11:30

Reporting Basis: WET Date Received: 05/24/2012 08:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	2.2	2.2		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1306	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-54	5/23/2012	11:30	water	Grab	18	X	X	X	X	X	X	X	X	X									
PRR1WATCMI-54	5/23/2012	11:45	water	Grab	9		X	X		X			X										
TB05232012	5/23/2012		water	_	3		X																

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP WS 15-4 for Effluent Samples and WS 15-5 for Effluent Samples

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	5/23/12	1800	5/24/12 0815			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/31/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCBs, Chlorinated Herbicides, Metals and Miscellaneous Analyses

SDG# PRR1306 (200-10949)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17538R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1306 (200-10949) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATCME-54	200-10949-1	Water	5/23/2012		X	X	X	X	X
PRR1WATCMI-54	200-10949-2	Water	5/23/2012		X	X	X		
TB05232012	200-10949-3	Water	5/23/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. SVOC – Semivolatile Organic Compounds by USEPA Method SOM0.1.2
3. PEST/PCB – Pesticides and PCBs by USEPA Method SOM01.2, and Chlorinated Herbicides by USEPA SW846 Method 8151A
4. MET - Metals by USEPA Method ISM01.2
5. MISC – Total Suspended Solids (TSS) by Standard Methods (SM) 2540D, Total Organic Carbon (TOC) by SM 5310B, and Cyanide by USEPA ISM01.2

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The carbon tetrachloride result for sample location PRR1WATCME-54 was qualified as not detected due to detection of the compound in the associated blanks. See Section 2, Blank Contamination.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	Carbon tetrachloride	Detected sample results > MDL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCME-54	Methylene chloride	48 E	55 D	55 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

SEMIVOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results were qualified as not detected due to detections of the compounds in the associated blanks. See Section 2, Blank Contamination.

Several results for sample location PRR1WATCME-54 were qualified as estimated due to the associated surrogates being diluted below the detection limit. See Section 3, Surrogates.

Several sample results for sample location PRR1WATCMI-54 were qualified as estimated because several surrogate recoveries could not be determined due to sample dilution. See Section 3, Surrogates.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	Phenol Di-n-butylphthalate	Detected sample results > MDL and < BAL	"UB" at the RL

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	Butylbenzylphthalate bis(2-Ethylhexyl)phthalate	Detected sample results > MDL and < BAL	"UB" at the RL

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique. Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Location	Surrogate	Recovery
PRR1WATCMI-54	Phenol-d5 Bis-(2-chloroethyl) ether-d8 2-Chlorophenol-d4 4-Methylphenol-d8 Nitrobenzene-d5 2-Nitrophenol-d4 Dimethylphthalate-d6 4-Nitrophenol-d4 Fluorene-d10 4,6-Dinitro-2-methylphenol-d2 Anthracene-d10 Pyrene-d10 Benzo(a)pyrene-d12	AC
	2,4-Dichlorophenol-d3 4-Chloroaniline-d4 Acenaphthylene-d8	D

D Diluted
AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of surrogate deviations, 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
Surrogates diluted below the calibration curve	Non-detect	J[1]
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

PESTICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results required qualification as not detected because the compounds were also detected in the associated method blank and/or field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

Several detected pesticides exhibited results that exceeded the 25 percent difference control limit between the primary and confirmation columns. The sample results are evaluated in section 6, Reporting.

The sample results for sample location PRR1WATCMI-54 were qualified as estimated because the TCMX surrogate recovery could not be determined due to sample dilution. See Section 3, Surrogates.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for common laboratory contaminants) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during pesticides analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. 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 Location	Analyte	Sample Result	Qualification
PRR1WATCME-54	gamma-BHC Endrin aldehyde gamma-Chlordane	Detected sample results < RL and < BAL	"UB" at the RL
	beta-BHC	Detected sample results > RL and < BAL	"UB" at detected sample concentration

RL Reporting limit

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique. Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Location	Surrogate	Recovery
PRR1WATCMI-54	Decachlorobiphenyl	AC
	Tetrachloro-m-xylene	D

D Diluted
AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of surrogate deviations, 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
Surrogates diluted below the calibration curve	Non-detect	J[1]
	Detect	

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCME-54	4,4'-DDT	0.27 E	0.23 D	0.23 D
PRR1WATCMI-54	4,4'-DDD	3.3 E	2.7 D	2.7 D
	4,4'-DDT	2.9 E	3.7 D	3.7 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

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 Location	Compound	%D
PRR1WATCME-54	2,4'-DDE	413.5 %
	2,4'-DDD	37.0 %
	alpha-BHC	178.0 %
	Heptachlor	999.9 %
	delta-BHC	33.9 %
	Aldrin	999.9 %
	Endosulfan I	999.9 %
	Endrin	345.0 %
	Endosulfan sulfate	999.9 %
	alpha-Chlordane	982.0 %
PRR1WATCMI-54	4,4'-DDD	272.8 %
	4,4'-DDT	78.7 %
	delta-BHC	999.9 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

AROCLOR PCB DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blanks or field blank at or above the PQL during PCB analysis.

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

CHLORINATED HERBICIDE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The 2,4,5-T result for sample location PRR1WATCMI-54 was qualified as estimated due to the surrogate being diluted below the detection limit. See Section 3, Surrogates.

The 2,4-DB result for sample location PRR1WATCME-54 was qualified as not detected because it exhibited a percent difference between the primary and confirmation columns that exceeded the control limit. The sample results are evaluated in section 7, Reporting.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) during herbicides analysis.

3. SURROGATES

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.

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

Sample Location	Surrogate	Recovery
PRR1WATCMI-54	2,4-Dichlorophenylacetic acid	D

D Diluted

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
Surrogates diluted below the calibration curve	Non-detect	UJ[1]
	Detect	J[1]

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

5. LABORATORY CONTROL SAMPLE (LCS)

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.

6. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. 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 Location	Compound	%D
PRR1WATCME-54	2,4-DB	99.5 %

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

Control Limit (%D)	Qualification
>25% to 70%	J
>70% to 100%	JN
>100% [1]	R
>100% to 200% (Interference detected)[2]	J or JN
>50% (sample results less than the RL)	U
>200%	R

When the pesticide sample results are less than the RL and the RPD greater than 50% the sample result are raised to the RL and reported as non-detect.

Note 1: If chromatogram 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).

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.

Qualifier	Description
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

10. Overall Assessment

Overall 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.

METALS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The lead and silver results for sample location PRR1WATCME-54 were qualified as not detected due to blank contamination. See Section 2, Blank Contamination.

The arsenic and zinc results for sample location PRR1WATCME-54 may have a high bias due to LCS recoveries that were greater than the upper control limit. See Section 3, Laboratory Control Sample.

The nickel and selenium results for sample location PRR1WATCME-54 were qualified as estimated due to serial dilution percent difference exceedances. See section 6, Serial Dilution.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during metals analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results associated with QA blank contamination that were greater than the BAL did not require qualification. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1WATCME-54	Lead Silver	Detected sample results < RL and < BAL	"UB" at the RL

RL = reporting limit

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. All LCS recoveries were within the control limits, with the exception of the analytes associated with sample locations, as presented in the following table.

Sample Location	Analyte	LCS Recovery
PRR1WATCME-54	Arsenic	127%
	Cadmium	126%
	Lead	124%
	Zinc	133%

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

Control limit	Sample Result	Qualification
LCS percent recovery 50% to 79%	Non-detect	UJ
	Detect	J
LCS percent recovery < 50%	Non-detect	R
	Detect	J
LCS percent recovery > 120%	Non-detect	No Action
	Detect	J

4. MATRIX SPIKE (MS)

The MS analysis is performed to determine the accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify

data. A control limit of 20% for water matrices and 35% for soil matrices is applied to concentrations that are at least five times the reporting limit (RL). 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 analysis was not performed on a sample location from within this SDG.

6. 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.

Sample location PRR1WATCME-54 was used in the serial dilution analysis. All serial dilutions were within the control limits, with the exception of the analyte presented in the following table. The nickel result for the diluted sample was greater than the nickel result for the undiluted sample.

Sample Location	Analyte	Serial Dilution (%D)
PRR1WATCME-54	Nickel	12 %
	Selenium	42 %

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. The qualifications are applied to all sample results associated with this analytical batch.

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

7. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

11. Overall Assessment

Overall 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.

CYANIDE, TSS, AND TOC DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. Analytes were detected in the associated QA blanks; however, the associated sample results were greater than the BAL 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. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCS analyses were performed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG contains no re-analyses. The COD analyses were performed at a 4-fold (4x) dilution in order to bring the concentrations within the calibration range. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL

Qualifier	Description
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY:	Dennis Dyke Project Scientist
SIGNATURE:	
DATE:	October 14, 2012
PEER REVIEW:	Joseph C. Houser
DATE:	October 18, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - PCBs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ
Aroclor-1016	ug/L	1	U	U
Aroclor-1221	ug/L	1	U	U
Aroclor-1232	ug/L	1	U	U
Aroclor-1242	ug/L	1	U	U
Aroclor-1248	ug/L	1	U	U
Aroclor-1254	ug/L	1	U	U
Aroclor-1260	ug/L	1	U	U

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Pesticides

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,4'-DDD	ug/L	0.018	P	J	2.7	P D	JND
2,4'-DDE	ug/L	0.01	J P	U	1.2	P	JN
2,4'-DDT	ug/L	0.054			3.7	P D	JND
4,4'-DDD	ug/L	0.053			NA		
4,4'-DDE	ug/L	0.018			NA		
4,4'-DDT	ug/L	0.23	D	D	NA		
Aldrin	ug/L	0.005	J P	U	NA		
Alpha-BHC	ug/L	0.005	J P B	U	NA		
Alpha-Chlordane	ug/L	0.005	J P	U	NA		
Beta-BHC	ug/L	0.028	B	UB	NA		
Delta-BHC	ug/L	0.016	P B	J	0.48	J P B	U
Dieldrin	ug/L	0.01	U	U	NA		
Endosulfan I	ug/L	0.005	J P	U	NA		
Endosulfan II	ug/L	0.011			NA		
Endosulfan Sulfate	ug/L	0.01	J P	U	NA		
Endrin	ug/L	0.01	J P	U	NA		
Endrin Aldehyde	ug/L	0.01	J P B	UB	NA		
Gamma-BHC (Lindane)	ug/L	0.005	J P	UB	NA		
Gamma-Chlordane	ug/L	0.005	J P B	UB	NA		
Heptachlor	ug/L	0.005	J P B	U	NA		
Heptachlor Epoxide	ug/L	0.0083			NA		
Toxaphene	ug/L	0.5	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Herbicides

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,4,5-T	ug/L	2.6			3100		J
2,4-D	ug/L	11			NA		
2,4-DB	ug/L	1.8	J p	U	NA		
Dinoseb	ug/L	0.99	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - VOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
1,1,1-Trichloroethane	ug/L	1	U	U	NA		
1,1,2,2-Tetrachloroethane	ug/L	1	U	U	NA		
1,1,2-Trichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethane	ug/L	1	U	U	NA		
1,1-Dichloroethene	ug/L	1	U	U	NA		
1,2,3-Trichlorobenzene	ug/L	1	U	U	25		
1,2,4-Trichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichlorobenzene	ug/L	1	U	U	NA		
1,2-Dichloroethane	ug/L	1	U	U	NA		
1,2-Dichloropropane	ug/L	0.9	J	J	NA		
1,3-Dichlorobenzene	ug/L	1	U	U	NA		
1,4-Dichlorobenzene	ug/L	1	U	U	NA		
2-Butanone	ug/L	27			39	J	J
Acrolein	ug/L	20	U	U	NA		
Acrylonitrile	ug/L	20	U	U	NA		
Benzene	ug/L	0.77	J	J	NA		
Bromodichloromethane	ug/L	1	U	U	NA		
Bromoform	ug/L	1	U	U	NA		
Bromomethane	ug/L	1	U	U	NA		
Carbon Tetrachloride	ug/L	1	J B	UB	NA		
Chlorobenzene	ug/L	3.4			NA		
Chloroethane	ug/L	1	U	U	NA		
Chloroform	ug/L	6.5			NA		
Chloromethane	ug/L	0.24	J	J	NA		
cis-1,3-Dichloropropene	ug/L	1	U	U	NA		
Dibromochloromethane	ug/L	1	U	U	NA		
Ethylbenzene	ug/L	1	U	U	NA		
Methylene Chloride	ug/L	55	B D	D	NA		
Tetrachloroethene	ug/L	1	U	U	NA		
Toluene	ug/L	0.023	J	J	NA		
trans-1,2-Dichloroethene	ug/L	1	U	U	NA		
trans-1,3-Dichloropropene	ug/L	1	U	U	NA		
Trichloroethene	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - VOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
Vinyl Chloride	ug/L	1	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - SVOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,2'-Oxybis(1-Chloropropane)	ug/L	4.9	U	U	NA		
2,4,5-Trichlorophenol	ug/L	4.9	U	UJ	1200		
2,4,6-Trichlorophenol	ug/L	0.095	J	J	NA		
2,4-Dichlorophenol	ug/L	4.9	U	UJ	NA		
2,4-Dimethylphenol	ug/L	4.9	U	U	NA		
2,4-Dinitrophenol	ug/L	9.9	U	U	NA		
2,4-Dinitrotoluene	ug/L	4.9	U	U	NA		
2,6-Dinitrotoluene	ug/L	4.9	U	U	NA		
2-Chlorophenol	ug/L	0.6	J	J	NA		
2-Nitrophenol	ug/L	4.9	U	U	NA		
3,3'-Dichlorobenzidine	ug/L	4.9	U	U	NA		
4,6-Dinitro-2-methylphenol	ug/L	9.9	U	U	210	U	U
4-Nitrophenol	ug/L	9.9	U	U	NA		
Anthracene	ug/L	4.9	U	U	NA		
Benzidine	ug/L	9.9	U	U	NA		
Benzo(a)anthracene	ug/L	4.9	U	U	NA		
Benzo(a)pyrene	ug/L	4.9	U	U	NA		
Benzo(b)fluoranthene	ug/L	4.9	U	U	NA		
Benzo(k)fluoranthene	ug/L	4.9	U	U	NA		
bis(2-Chloroethyl)ether	ug/L	4.9	U	U	NA		
bis(2-Ethylhexyl)phthalate	ug/L	4.9	J B	UB	NA		
Butylbenzylphthalate	ug/L	4.9	J B	UB	NA		
Chrysene	ug/L	4.9	U	U	NA		
Dibenzo(a,h)anthracene	ug/L	4.9	U	U	NA		
Diethylphthalate	ug/L	4.9	U	U	NA		
Dimethylphthalate	ug/L	4.9	U	U	NA		
Di-n-Butylphthalate	ug/L	4.9	J B	UB	NA		
Fluoranthene	ug/L	4.9	U	U	NA		
Fluorene	ug/L	4.9	U	U	NA		
Hexachlorobenzene	ug/L	4.9	U	U	NA		
Hexachlorobutadiene	ug/L	4.9	U	UJ	NA		
Hexachlorocyclopentadiene	ug/L	4.9	U	UJ	NA		
Hexachloroethane	ug/L	4.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - SVOCs

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
Indeno(1,2,3-cd)pyrene	ug/L	4.9	U	U	NA		
Isophorone	ug/L	4.9	U	U	NA		
Naphthalene	ug/L	4.9	U	UJ	NA		
Nitrobenzene	ug/L	4.9	U	U	NA		
N-Nitrosodimethylamine	ug/L	9.9	U	U	NA		
N-Nitrosodiphenylamine	ug/L	4.9	U	U	NA		
Pentachlorophenol	ug/L	9.9	U	UJ	NA		
Phenanthrene	ug/L	4.9	U	U	NA		
Phenol	ug/L	4.9	J B	UB	NA		
Pyrene	ug/L	4.9	U	U	NA		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Inorganics

ANALYTE	Units	PRR1WATCME-54	LQ	VQ
Antimony	ug/L	12.9		
Arsenic	ug/L	7.7		J
Beryllium	ug/L	1	U	U
Cadmium	ug/L	1	U	U
Chromium	ug/L	1.7	J	J
Copper	ug/L	3.4		
Cyanide	ug/L	2.7	J	J
Lead	ug/L	1	J	UB
Mercury	ug/L	0.2	U	U
Nickel	ug/L	10.8	E	J
Selenium	ug/L	13.2	E	J
Silver	ug/L	1	J	UB
Zinc	ug/L	14.2		J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1306 - Miscellanous

ANALYTE	Units	PRR1WATCME-54	LQ	VQ
Total Organic Carbon	mg/L	5.9	B	
Total Suspended Solids	mg/L	2.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1306
Matrix: WATER Lab Sample Id: 200-10949-1
% Solids: Date Received: 05/24/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	12.9			MS
7440-38-2	Arsenic	7.7		J	MS
7440-41-7	Beryllium	1.0	U		MS
7440-43-9	Cadmium	1.0	U		MS
7440-47-3	Chromium	1.7	J		MS
7440-50-8	Copper	3.4			MS
7439-92-1	Lead	1.0 ~~0.82~~	~~J~~	UB	MS
7440-02-0	Nickel	10.8		~~E~~ J	MS
7782-49-2	Selenium	13.2		~~E~~ J	MS
7440-22-4	Silver	1.0 ~~0.062~~	~~J~~	UB	MS
7440-66-6	Zinc	14.2		J	MS

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1306
Matrix: WATER Lab Sample Id: 200-10949-1
% Solids: Date Received: 05/24/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20	U		CV

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:
Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA
Lab Code: TABVT Case No.: RAPHASI Mod. Ref. No.: SDG No.: PRR1306
Matrix: WATER Lab Sample Id: 200-10949-1
% Solids: Date Received: 05/24/2012

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	2.7	J		AS

Color Before: WHITE Clarity Before: CLOUDY Texture:
Color After: Clarity After: Artifacts:
Comments:

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.24	J
75-01-4	Vinyl chloride	1.0	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	1.0	U
107-02-8	Acrolein	20	U
75-35-4	1,1-Dichloroethene	1.0	U
75-09-2	Methylene chloride	55 ~~48~~	~~E B~~ D
107-13-1	Acrylonitrile	20	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
78-93-3	2-Butanone	27	
67-66-3	Chloroform	6.5	
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0 ~~0.029~~	~~J B~~ UB
71-43-2	Benzene	0.77	J
107-06-2	1,2-Dichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	0.90	J
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	0.023	J
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.0	U
108-90-7	Chlorobenzene	3.4	
100-41-4	Ethylbenzene	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
87-61-6	1,2,3-Trichlorobenzene	1.0	U

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.33	J D
75-01-4	Vinyl chloride	1.7	U
74-83-9	Bromomethane	1.7	U
75-00-3	Chloroethane	1.7	U
107-02-8	Acrolein	34	U
75-35-4	1,1-Dichloroethene	1.7	U
75-09-2	Methylene chloride	55	B D
107-13-1	Acrylonitrile	34	U
156-60-5	trans-1,2-Dichloroethene	1.7	U
75-34-3	1,1-Dichloroethane	1.7	U
78-93-3	2-Butanone	33	D
67-66-3	Chloroform	7.6	D
71-55-6	1,1,1-Trichloroethane	1.7	U
56-23-5	Carbon tetrachloride	0.053	J B D
71-43-2	Benzene	0.93	J D
107-06-2	1,2-Dichloroethane	1.7	U
79-01-6	Trichloroethene	1.7	U
78-87-5	1,2-Dichloropropane	1.7	U
75-27-4	Bromodichloromethane	1.7	U
10061-01-5	cis-1,3-Dichloropropene	1.7	U
108-88-3	Toluene	0.039	J B D
10061-02-6	trans-1,3-Dichloropropene	1.7	U
79-00-5	1,1,2-Trichloroethane	1.7	U
127-18-4	Tetrachloroethene	1.7	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCME-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOF05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 3.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	1.7	U
108-90-7	Chlorobenzene	4.1	B D
100-41-4	Ethylbenzene	1.7	U
75-25-2	Bromoform	1.7	U
79-34-5	1,1,2,2-Tetrachloroethane	1.7	U
541-73-1	1,3-Dichlorobenzene	1.7	U
106-46-7	1,4-Dichlorobenzene	1.7	U
95-50-1	1,2-Dichlorobenzene	1.7	U
120-82-1	1,2,4-Trichlorobenzene	1.7	U
87-61-6	1,2,3-Trichlorobenzene	1.7	U

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB24.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 15.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	39	J
87-61-6	1,2,3-Trichlorobenzene	25	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05232012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB26.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/26/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
107-02-8	Acrolein	10	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene chloride	0.038	J B
107-13-1	Acrylonitrile	10	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
78-93-3	2-Butanone	5.0	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.015	J B
71-43-2	Benzene	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB05232012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB26.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/26/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.31	J
100-41-4	Ethylbenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: RJZWR05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/31/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	9.9	U
108-95-2	Phenol	4.9 ~~0.89~~	~~J B~~ UB
111-44-4	Bis(2-chloroethyl)ether	4.9	U
95-57-8	2-Chlorophenol	0.60	J
108-60-1	2,2'-Oxybis(1-chloropropane)	4.9	U
67-72-1	Hexachloroethane	4.9	U
98-95-3	Nitrobenzene	4.9	U
78-59-1	Isophorone	4.9	U
88-75-5	2-Nitrophenol	4.9	U
105-67-9	2,4-Dimethylphenol	4.9	U
120-83-2	2,4-Dichlorophenol	4.9	U J
91-20-3	Naphthalene	4.9	U J
87-68-3	Hexachlorobutadiene	4.9	U J
77-47-4	Hexachlorocyclopentadiene	4.9	U J
88-06-2	2,4,6-Trichlorophenol	0.095	J
95-95-4	2,4,5-Trichlorophenol	4.9	U J
131-11-3	Dimethylphthalate	4.9	U
606-20-2	2,6-Dinitrotoluene	4.9	U
51-28-5	2,4-Dinitrophenol	9.9	U
100-02-7	4-Nitrophenol	9.9	U
121-14-2	2,4-Dinitrotoluene	4.9	U
84-66-2	Diethylphthalate	4.9	U
86-73-7	Fluorene	4.9	U
534-52-1	4,6-Dinitro-2-methylphenol	9.9	U
86-30-6	N-Nitrosodiphenylamin [1]	4.9	U
118-74-1	Hexachlorobenzene	4.9	U
87-86-5	Pentachlorophenol	9.9	U J
85-01-8	Phenanthrene	4.9	U
120-12-7	Anthracene	4.9	U
84-74-2	Di-n-butylphthalate	4.9 ~~0.16~~	~~J B~~ UB
206-44-0	Fluoranthene	4.9	U
92-87-5	Benzidine	9.9	U
129-00-0	Pyrene	4.9	U

1E - FORM I SV-2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1020 (g/mL) mL Lab File ID: RJZWR05.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/31/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
85-68-7	Butylbenzylphthalate	4.9 ~~0.14~~	~~J B~~ UB
91-94-1	3,3'-Dichlorobenzidine	4.9	U J
56-55-3	Benzo(a)anthracene	4.9	U
218-01-9	Chrysene	4.9	U
117-81-7	Bis(2-ethylhexyl)phthalate	4.9 ~~0.22~~	~~J B~~ UB
205-99-2	Benzo(b)fluoranthene	4.9	U
207-08-9	Benzo(k)fluoranthene	4.9	U
50-32-8	Benzo(a)pyrene	4.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	4.9	U
53-70-3	Dibenzo(a,h)anthracene	4.9	U

[1]Cannot be separated from Diphenylamine

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 970 (g/mL) mL Lab File ID: RJZWR07.D

Level: (LOW/MED) LOW Extraction: (Type) CONT

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Extracted: 05/24/2012

Injection Volume: 2.0 (uL) GPC Factor: 1.0 Date Analyzed: 05/31/2012

GPC Cleanup: (Y/N) N pH: Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
95-95-4	2,4,5-Trichlorophenol	1200	
534-52-1	4,6-Dinitro-2-methylphenol	210	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 25MAY121434-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SOM01.2LL_PEST Date Extracted: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.010 ~~0.0035~~	~~J P~~ U
789-02-6	2,4'-DDT	0.054	
53-19-0	2,4'-DDD	0.018	~~P~~ J

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 25MAY121640-R031.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q	
319-84-6	alpha-BHC	0.0050 ~~0.00011~~	~~J P B~~	U
319-85-7	beta-BHC	0.028 ~~0.028~~	~~B~~	UB
319-86-8	delta-BHC	0.016 ~~0.016~~	~~P B~~	U J
58-89-9	gamma-BHC (Lindane)	0.0050 ~~0.00036~~	~~J P~~	UB
76-44-8	Heptachlor	0.0050 ~~0.00017~~	~~J P B~~	U
309-00-2	Aldrin	0.0050 ~~0.00080~~	~~J P~~	U
1024-57-3	Heptachlor epoxide	0.0083		
959-98-8	Endosulfan I	0.0050 ~~0.00067~~	~~J P~~	U
60-57-1	Dieldrin	0.010	U	
72-55-9	4,4'-DDE	0.018		
72-20-8	Endrin	0.010 ~~0.0016~~	~~J P~~	U
33213-65-9	Endosulfan II	0.011		
72-54-8	4,4'-DDD	0.053		
1031-07-8	Endosulfan sulfate	0.010 ~~0.000090~~	~~J P~~	U
50-29-3	4,4'-DDT	0.23 ~~0.27~~	~~E~~ D	
7421-93-4	Endrin aldehyde	0.010 ~~0.0011~~	~~J P B~~	UB
5103-71-9	alpha-Chlordane	0.0050 ~~0.0010~~	~~J P~~	U
5103-74-2	gamma-Chlordane	0.0050 ~~0.00021~~	~~J P B~~	UB
8001-35-2	Toxaphene	0.50	U	

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 1000 (g/mL) mL Lab File ID: 29MAY121422-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 05/29/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 3.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-84-6	alpha-BHC	0.00023	J P D B
319-85-7	beta-BHC	0.030	D B
319-86-8	delta-BHC	0.017	P D B
58-89-9	gamma-BHC (Lindane)	0.00030	J P D
76-44-8	Heptachlor	0.00017	J P D B
309-00-2	Aldrin	0.00088	J P D
1024-57-3	Heptachlor epoxide	0.0086	J D
959-98-8	Endosulfan I	0.00067	J P D
60-57-1	Dieldrin	0.030	U
72-55-9	4,4'-DDE	0.017	J D
72-20-8	Endrin	0.0017	J P D
33213-65-9	Endosulfan II	0.011	J D
72-54-8	4,4'-DDD	0.048	D
1031-07-8	Endosulfan sulfate	0.030	U
50-29-3	4,4'-DDT	0.23	D
7421-93-4	Endrin aldehyde	0.0012	J P D B
5103-71-9	alpha-Chlordane	0.0010	J P D
5103-74-2	gamma-Chlordane	0.00077	J P D B
8001-35-2	Toxaphene	1.5	U

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 25MAY121434-R091.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	1.2	~~P~~ JN
53-19-0	2,4'-DDD	2.7 ~~3.3~~	~~E P~~ JND
789-02-6	2,4'-DDT	3.7 ~~2.9~~	~~E P~~ JND

1G - FORM I PEST

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCMI-54DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 25MAY121434-R081.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
3424-82-6	2,4'-DDE	0.99	P D
53-19-0	2,4'-DDD	2.7	P D
789-02-6	2,4'-DDT	3.7	P D

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATCMI-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: _____ SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-2

Sample wt/vol: 1040 (g/mL) mL Lab File ID: 25MAY121640-R071.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/25/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: _____ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
319-86-8	delta-BHC	0.48 ~~0.16~~	~~J P B~~ U

1H - FORM I ARO

AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATCME-54

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1306

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10949-1

Sample wt/vol: 985 (g/mL) mL Lab File ID: 25MAY121455-R051.D

% Moisture: Decanted: (Y/N) Date Received: 05/24/2012

Extraction: (Type) SEPF Date Extracted: 05/24/2012

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 05/26/2012

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I

HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCME-54 Lab Sample ID: 200-10949-1

Matrix: Water Lab File ID: 30may121001-r051.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:30

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 960(mL) Date Analyzed: 05/30/2012 12:42

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	11		2.0	0.68
94-82-6	2,4-DB	1.8 ~~0.67~~	~~J p~~ U	1.8	0.49
88-85-7	Dinoseb	0.99	U	0.99	0.20
93-76-5	2,4,5-T	2.6		0.49	0.14

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	110		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCME-54 Lab Sample ID: 200-10949-1

Matrix: Water Lab File ID: 30may121001-r051.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:30

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 960(mL) Date Analyzed: 05/30/2012 12:42

Con. Extract Vol.: 10000(uL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	88		60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCMI-54 Lab Sample ID: 200-10949-2

Matrix: Water Lab File ID: 30may121001-r061.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:45

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 1035(mL) Date Analyzed: 05/30/2012 13:10

Con. Extract Vol.: 10000(uL) Dilution Factor: 500

Injection Volume: 1(uL) GC Column: RTX-CLP ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	3100	J	230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-10949-2

SDG No.: PRR1306

Client Sample ID: PRR1WATCMI-54 Lab Sample ID: 200-10949-2

Matrix: Water Lab File ID: 30may121001-r061.d

Analysis Method: 8151A Date Collected: 05/23/2012 11:45

Extraction Method: 8151A Date Extracted: 05/26/2012 07:30

Sample wt/vol: 1035(mL) Date Analyzed: 05/30/2012 13:10

Con. Extract Vol.: 10000(uL) Dilution Factor: 500

Injection Volume: 1(uL) GC Column: RTX-CLPII ID: 0.32(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 39534 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	0	X	60-130

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-54 | Lab Sample ID: 200-10949-1

Lab Name: TestAmerica Burlington | Job No.: 200-10949-2

SDG ID.: PRR1306

Matrix: Water | Date Sampled: 05/23/2012 11:30

Reporting Basis: WET | Date Received: 05/24/2012 08:15

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-44-0	Total Organic Carbon	5.9	1.0	0.14	mg/L		B	1	SM 5310B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-54 Lab Sample ID: 200-10949-1

Lab Name: TestAmerica Burlington Job No.: 200-10949-3

SDG ID.: PRR1306

Matrix: Water Date Sampled: 05/23/2012 11:30

Reporting Basis: WET Date Received: 05/24/2012 08:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	2.2	2.2		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1306	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-54	5/23/2012	11:30	water	Grab	18	X	X	X	X	X	X	X	X	X									
PRR1WATCMI-54	5/23/2012	11:45	water	Grab	9		X	X		X			X										
TB05232012	5/23/2012		water	_	3		X																

Requested Analyses	
1	TOC
2	VOCs
3	SVOCs
4	Aroclor PCBs
5	Pesticides
6	Metals + Hg
7	Cyanide
8	Herbicides
9	TSS
10	
11	
12	
13	
14	
15	
16	

Special Instructions/Comments:
Refer to RAWP QAPP WS 15-4 for Effluent Samples and WS 15-5 for Effluent Samples

☐ **Special QA/QC Instructions**

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT; TSS samples 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kavin Gandhi	5/23/12	1800	5/24/12 0815			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/31/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCBs as Congeners Analyses

SDG# PRR1306 (33802)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #17539R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1306 (33802) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1WATCME-54	33802-001	Soil	5/23/2012				X	X	
PRR1WATCMI-54	33802-002	Soil	5/23/2012				X	X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613
2. PCB – Polychlorinated Biphenyls as Congeners by USEPA Method 1668A

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQL) or the EDLs during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

6. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in the sample PRR1WATCMI-54 and confirmation analysis was performed.

7. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCMI-54	2,3,7,8 TCDD	13200 E	--	13200 EJ
	OCDF	54300 E	--	54300 EJ

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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

The laboratory qualified with "P" the total TCDF and total PeCDF results for sample location PRR1WATCMI-54 to indicate that there was possible chlorinated diphenylether interference with the results. The total TCDF and total PeCDF results for PRR1WATCMI-54 were qualified as estimated maximum possible concentrations (EMPCs).

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.
P	The amount reported is the maximum possible concentration due to possible chlorinated diphenylether interference.

11. Overall Assessment

Overall 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.

CONGENER PCB DATA VERIFICATION VALIDATION REPORT
SUMMARY OF FINDINGS

Major

None.

Minor

Some sample results required qualification as not detected because the compounds were also detected in the associated method blank and field blank. See Section 2, Blank Contamination, for a list of the sample results that were qualified due to blank contamination.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated method blank or field blank at or above the project quantitation limits (PQL) during PCB analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as 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).

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	PCB-11 PCB-52/69 PCB-61/70 PCB-84/92 PCB-87/117/125	Detected sample results > RL and < BAL	"UB" at the detected sample concentration

Sample Location	Compound	Sample Result	Qualification
PRR1WATCME-54	PCB-90/101 PCB-95/98/102 PCB-99 PCB-105 PCB-106/118 PCB-110 PCB-138/163/164 PCB-139/149 PCB-153 Total diCB Total pentaCB Total hexaCB	Detected sample results > RL and < BAL	"UB" at the detected sample concentration
	PCB-77 PCB-123	Detected sample results < RL and < BAL	"UB" at the RL

RL = reporting limit

3. SURROGATES

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.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits.

4. LABORATORY CONTROL SAMPLE (LCS)

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.

5. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision 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 field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG contains a dilution analysis for sample location PRR1WATCMI-54. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the

linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATCMI-54	PCB-209	71100 E	--	71100 EJ

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 < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.
D	Dilution

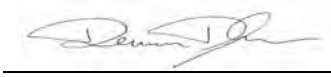
The laboratory added the qualifier “I” which is defined by the laboratory as “Chemical Interference.“ These samples results were qualified as estimated (J).

The laboratory qualifier “*” was applied to PCB congener results that were reported at a lower detection limit relative to other congeners. Since this qualifier has no impact on the usability of the data, this qualifier has been removed.

9. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 14, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 18, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - PCB Congeners

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
PCB-1	pg/L	6.83			99000	D	D
PCB-2	pg/L	5.27	U	U	50400	D	D
PCB-3	pg/L	5.27	U	U	24500	D	D
PCB-4/10	pg/L	10.5	U	U	11200	D	D
PCB-5/8	pg/L	16.8			21600	D	D
PCB-6	pg/L	10.5	U	U	7400	D	D
PCB-7/9	pg/L	10.8			15700	D	D
PCB-11	pg/L	29.8	B	UB	6950	B,D	D
PCB-12/13	pg/L	25.3			35300	D	D
PCB-14	pg/L	13.8			11600	D	D
PCB-15	pg/L	10.5	U	U	3680	D	D
PCB-16/32	pg/L	8.13			1470	D	D
PCB-17	pg/L	5.27	U	U	921	D	D
PCB-18	pg/L	9.97			3350	D	D
PCB-19	pg/L	5.27	U	U	229	D	D
PCB-20/21/33	pg/L	13.4			3610	D	D
PCB-22	pg/L	5.62			1290	D	D
PCB-23	pg/L	5.27	U	U	786	D	D
PCB-24/27	pg/L	7.48			3500	D	D
PCB-25	pg/L	5.27	U	U	222	D	D
PCB-26	pg/L	5.27	U	U	1870	D	D
PCB-28	pg/L	14.8			3860	D	D
PCB-29	pg/L	5.27	U	U	426	D	D
PCB-30	pg/L	5.27	U	U	183	D	D
PCB-31	pg/L	12.4			3110	D	D
PCB-34	pg/L	5.27	U	U	500	D	D
PCB-35	pg/L	5.27	U	U	955	D	D
PCB-36	pg/L	5.27	U	U	285	D	D
PCB-37	pg/L	11			3460	D	D
PCB-38	pg/L	5.27	U	U	103	D	D
PCB-39	pg/L	5.27	U	U	632	D	D
PCB-40	pg/L	5.27	U	U	103	U,D	U
PCB-41/64/71/72	pg/L	11.2			1280	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - PCB Congeners

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
PCB-42/59	pg/L	5.27	U	U	391	D	D
PCB-43/49	pg/L	8.95			997	D	D
PCB-44	pg/L	9.49			1210	D	D
PCB-45	pg/L	5.27	U	U	228	D	D
PCB-46	pg/L	5.27	U	U	103	U,D	U
PCB-47	pg/L	5.4			412	D	D
PCB-48/75	pg/L	5.27	U	U	307	U,D,I	UJ
PCB-50	pg/L	5.27	U	U	103	U,D	U
PCB-51	pg/L	5.27	U	U	78.6	D,J	DJ
PCB-52/69	pg/L	12.4	B	UB	1280	B,D	D
PCB-53	pg/L	5.27	U	U	214	D	D
PCB-54	pg/L	5.27	U	U	103	U,D	U
PCB-55	pg/L	5.27	U	U	103	U,D	U
PCB-56/60	pg/L	8.41			930	D	D
PCB-57	pg/L	5.27	U	U	103	U,D	U
PCB-58	pg/L	5.27	U	U	103	U,D	U
PCB-61/70	pg/L	14.3	B	UB	1270	B,D	D
PCB-62	pg/L	5.27	U	U	103	U,D	U
PCB-63	pg/L	5.27	U	U	103	U,D	U
PCB-65	pg/L	5.27	U	U	103	U,D	U
PCB-67	pg/L	5.27	U	U	103	U,D	U
PCB-68	pg/L	5.27	U	U	103	U,D	U
PCB-73	pg/L	5.27	U	U	103	U,D	U
PCB-74	pg/L	12.6			1790	D	D
PCB-76/66	pg/L	13			1300	D	D
PCB-77	pg/L	5.27	J,B	UB	225	B,D	D
PCB-78	pg/L	5.27	U	U	103	U,D	U
PCB-79	pg/L	5.27	U	U	135	U,D,I	UJ
PCB-80	pg/L	5.27	U	U	103	U,D	U
PCB-81	pg/L	0.369	J	J	59.7	D,J	DJ
PCB-82	pg/L	5.27	U	U	120		
PCB-83	pg/L	5.27	U	U	11.5		
PCB-84/92	pg/L	7.77	B	UB	442	B	

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - PCB Congeners

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
PCB-85/116	pg/L	5.27	U	U	143		
PCB-86	pg/L	5.27	U	U	55.9		
PCB-87/117/125	pg/L	6.75	B	UB	366	B	
PCB-88/91	pg/L	5.27	U	U	144		
PCB-89	pg/L	5.27	U	U	24.3		
PCB-90/101	pg/L	18.1	B	UB	956	B	
PCB-93	pg/L	5.27	U	U	5.15	U	U
PCB-94	pg/L	5.27	U	U	11.8		
PCB-95/98/102	pg/L	14.8	B	UB	756	B	
PCB-96	pg/L	5.27	U	U	12.8		
PCB-97	pg/L	5.27	U	U	267	B	
PCB-99	pg/L	13.1	B	UB	767	B	
PCB-100	pg/L	5.27	U	U	13.3		
PCB-103	pg/L	5.27	U	U	18.1		
PCB-104	pg/L	5.27	U	U	5.15	U	U
PCB-105	pg/L	7.94	B	UB	423	B	
PCB-106/118	pg/L	28	B	UB	1600	B	
PCB-107/109	pg/L	5.27	U	U	95.4		
PCB-108/112	pg/L	5.27	U	U	59.3		
PCB-110	pg/L	18.7	B	UB	1010	B	
PCB-111/115	pg/L	5.27	U	U	79.6		
PCB-113	pg/L	5.27	U	U	5.35		
PCB-114	pg/L	5.73			426		
PCB-119	pg/L	5.27	U	U	42.9		
PCB-120	pg/L	5.27	U	U	7.74		
PCB-121	pg/L	5.27	U	U	5.15	U	U
PCB-122	pg/L	5.27	U	U	5.15	U	U
PCB-123	pg/L	5.27	J,B	UB	72.3	B	
PCB-124	pg/L	5.27	U	U	68.2		
PCB-126	pg/L	1.98	U,*	U	39.8		
PCB-127	pg/L	5.27	U	U	5.15	U	U
PCB-128/162	pg/L	4.43	J	J	232	U,I	UJ
PCB-129	pg/L	5.27	U	U	58.2		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - PCB Congeners

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
PCB-130	pg/L	5.27	U	U	48		
PCB-131	pg/L	5.27	U	U	22.1		
PCB-132/161	pg/L	7.04			177		
PCB-133/142	pg/L	5.27	U	U	27.6		
PCB-134/143	pg/L	5.27	U	U	37.9		
PCB-135	pg/L	5.27	U	U	104		
PCB-136	pg/L	5.27	U	U	120		
PCB-137	pg/L	5.27	U	U	50.2		
PCB-138/163/164	pg/L	25.5	B	UB	825	B	
PCB-139/149	pg/L	14	B	UB	585	B	
PCB-140	pg/L	5.27	U	U	5.15	U	U
PCB-141	pg/L	8.6			339		
PCB-144	pg/L	5.27	U	U	59.5		
PCB-145	pg/L	5.27	U	U	5.15	U	U
PCB-146/165	pg/L	5.27	U	U	109		
PCB-147	pg/L	5.27	U	U	16.3		
PCB-148	pg/L	5.27	U	U	6.29	U,I	UJ
PCB-150	pg/L	5.27	U	U	8.48		
PCB-151	pg/L	5.27	U	U	182		
PCB-152	pg/L	5.27	U	U	5.15	U	U
PCB-153	pg/L	26.9	B	UB	880	B	
PCB-154	pg/L	5.27	U	U	38.8		
PCB-155	pg/L	5.27	U	U	14		
PCB-156	pg/L	13.3			497		
PCB-157	pg/L	1.82	U,*	U	50.7		
PCB-158/160	pg/L	5.27	U	U	169		
PCB-159	pg/L	5.27	U	U	5.15	U	U
PCB-166	pg/L	5.27	U	U	86.1		
PCB-167	pg/L	3.45	U,*	U	130		
PCB-168	pg/L	5.27	U	U	5.15	U	U
PCB-169	pg/L	0.857	U,*	U	7.54	U,I	UJ
PCB-170	pg/L	10.6	U,I	UJ	341		
PCB-171	pg/L	5.27	U	U	71.4		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - PCB Congeners

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
PCB-172	pg/L	5.27	U	U	87.6		
PCB-173	pg/L	5.27	U	U	23.4		
PCB-174	pg/L	16.4			355		
PCB-175	pg/L	5.27	U	U	30		
PCB-176	pg/L	5.27	U	U	5.15	U	U
PCB-177	pg/L	6.56			140		
PCB-178	pg/L	5.27	U	U	91.1		
PCB-179	pg/L	6.01			172		
PCB-180	pg/L	38.2			1140		
PCB-181	pg/L	5.27	U	U	10.3		
PCB-182/187	pg/L	19.2			599		
PCB-183	pg/L	7.47			263		
PCB-184	pg/L	5.27	U	U	11.4		
PCB-185	pg/L	5.27	U	U	113		
PCB-186	pg/L	5.27	U	U	5.15	U	U
PCB-188	pg/L	5.27	U	U	7.55		
PCB-189	pg/L	5.03	J	J	179		
PCB-190	pg/L	9.56	U,I	UJ	573	U,I	UJ
PCB-191	pg/L	5.27	U	U	35.6		
PCB-192	pg/L	5.27	U	U	7.2		
PCB-193	pg/L	5.27	U	U	41.6		
PCB-194	pg/L	23.4			685		
PCB-195	pg/L	6.08			172		
PCB-196/203	pg/L	34.4			926		
PCB-197	pg/L	5.27	U	U	29.1		
PCB-198	pg/L	5.27	U	U	67.1		
PCB-199	pg/L	34			766		
PCB-200	pg/L	5.27	U	U	86		
PCB-201	pg/L	5.27	U	U	93.2		
PCB-202	pg/L	13.6			276		
PCB-204	pg/L	5.27	U	U	6.16		
PCB-205	pg/L	17.9	U,I	UJ	172	U,I	UJ
PCB-206	pg/L	78.2			2110		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - PCB Congeners

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
PCB-207	pg/L	8.16	U,I	UJ	238		
PCB-208	pg/L	25.4			517		
PCB-209	pg/L	1110			71100	E	EJ
Total monoCB	pg/L	6.83			174000		
Total diCB	pg/L	96.5	B	UB	113000	B	
Total triCB	pg/L	82.8			30800		
Total tetraCB	pg/L	100	B		11700	B	
Total pentaCB	pg/L	122	B	UB	8040	B	
Total hexaCB	pg/L	99.8	B	UB	4630	B	
Total heptaCB	pg/L	99			3720		
Total octaCB	pg/L	111			3110		
Total nonaCB	pg/L	104			2860		
Total decaCB	pg/L	1110			71100		J
Total PCB	pg/L	1930	B		423000	B	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1306 - Dioxins/Furans

ANALYTE	Units	PRR1WATCME-54	LQ	VQ	PRR1WATCMI-54	LQ	VQ
2,3,7,8-TCDD	pg/L	113			13200	E	EJ
1,2,3,7,8-PeCDD	pg/L	1.84	U	U	49.8		
1,2,3,4,7,8-HxCDD	pg/L	1.66	U	U	23.6	J	J
1,2,3,6,7,8-HxCDD	pg/L	1.89	U	U	38.2		
1,2,3,7,8,9-HxCDD	pg/L	2.03	U	U	15.6	J	J
1,2,3,4,6,7,8-HpCDD	pg/L	3.24	U	U	189		
OCDD	pg/L	97.8			12400		
Total TCDD	pg/L	118			14600		
Total PeCDD	pg/L	3.93	EMPC	EMPC	838		
Total HxCDD	pg/L	3.47			607		
Total HpCDD	pg/L	3.24	U	U	460		
2,3,7,8-TCDF	pg/L	1.55	U	U	48.1		
1,2,3,7,8-PeCDF	pg/L	1.35	EMPC	EMPC	108		
2,3,4,7,8-PeCDF	pg/L	9.03	J	J	762		
1,2,3,4,7,8-HxCDF	pg/L	74.7			5410		
1,2,3,6,7,8-HxCDF	pg/L	12.2	J	J	786		
1,2,3,7,8,9-HxCDF	pg/L	1.65	EMPC	EMPC	117		
2,3,4,6,7,8-HxCDF	pg/L	5.67	J	J	347		
1,2,3,4,6,7,8-HpCDF	pg/L	159			13500		
1,2,3,4,7,8,9-HpCDF	pg/L	8.36	J	J	680		
OCDF	pg/L	488			54300	E	EJ
Total TCDF	pg/L	32.6			5060	P	EMPC
Total PeCDF	pg/L	74.9			5710	P	EMPC
Total HxCDF	pg/L	149			10800		
Total HpCDF	pg/L	186			15600		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/L	128			14300		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: **PRR1WATCME-54** **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33802-001	Date Received:	24-May-12
Project:	PRR1306	Sample Size:	0.973 L	QC Batch No.:	4455	Date Extracted:	24-May-12
Date Collected:	23-May-12			Date Analyzed DB-5:	25-May-12	Date Analyzed DB-225:	NA
Time Collected:	1130						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	113			
1,2,3,7,8-PeCDD	ND	1.84		
1,2,3,4,7,8-HxCDD	ND	1.66		
1,2,3,6,7,8-HxCDD	ND	1.89		
1,2,3,7,8,9-HxCDD	ND	2.03		
1,2,3,4,6,7,8-HpCDD	ND	3.24		
OCDD	97.8			
2,3,7,8-TCDF	ND	1.55		
1,2,3,7,8-PeCDF	ND		1.35	
2,3,4,7,8-PeCDF	9.03			J
1,2,3,4,7,8-HxCDF	74.7			
1,2,3,6,7,8-HxCDF	12.2			J
2,3,4,6,7,8-HxCDF	5.67			J
1,2,3,7,8,9-HxCDF	ND		1.65	
1,2,3,4,6,7,8-HpCDF	159			
1,2,3,4,7,8,9-HpCDF	8.36			J
OCDF	488			

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	78.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	66.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	86.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	79.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	82.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	77.6	23 - 140	
	13C-OCDD	72.4	17 - 157	
	13C-2,3,7,8-TCDF	80.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	64.5	24 - 185	
	13C-2,3,4,7,8-PeCDF	64.8	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	72.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	71.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	72.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	70.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	68.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	71.2	26 - 138	
	13C-OCDF	66.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	94.8	35 - 197	

Totals				
Total TCDD	118		123	
Total PeCDD	ND		3.93	
Total HxCDD	3.47			
Total HpCDD	ND	3.24		
Total TCDF	32.6		39.9	
Total PeCDF	74.9		76.2	
Total HxCDF	149		155	
Total HpCDF	186			

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): **127**

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: ANP

Approved By: Calvin Tanaka 29-May-2012 12:57

Sample ID: PRR1WATCMI-54 **EPA Method 1613**

Client Data		Sample Data		Laboratory Data			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33802-002	Date Received:	24-May-12
Project:	PRR1306	Sample Size:	1.02 L	QC Batch No.:	4455	Date Extracted:	24-May-12
Date Collected:	23-May-12			Date Analyzed DB-5:	25-May-12	Dates Analyzed DB-225:	29-May-12
Time Collected:	1145						

Analyte	Conc. (pg/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	13200			E J
1,2,3,7,8-PeCDD	49.8			
1,2,3,4,7,8-HxCDD	23.6			J
1,2,3,6,7,8-HxCDD	38.2			
1,2,3,7,8,9-HxCDD	15.6			J
1,2,3,4,6,7,8-HpCDD	189			
OCDD	12400			
2,3,7,8-TCDF	48.1			
1,2,3,7,8-PeCDF	108			
2,3,4,7,8-PeCDF	762			
1,2,3,4,7,8-HxCDF	5410			
1,2,3,6,7,8-HxCDF	786			
2,3,4,6,7,8-HxCDF	347			
1,2,3,7,8,9-HxCDF	117			
1,2,3,4,6,7,8-HpCDF	13500			
1,2,3,4,7,8,9-HpCDF	680			
OCDF	54300			E J

Labeled Standard		%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	88.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	71.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	90.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	85.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	82.2	23 - 140	
	13C-OCDD	84.8	17 - 157	
	13C-2,3,7,8-TCDF	81.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	69.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	69.0	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	81.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	77.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	77.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	73.6	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	78.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	76.2	26 - 138	
	13C-OCDF	90.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	122	35 - 197	

Totals			
Total TCDD	14600		
Total PeCDD	838		
Total HxCDD	607		
Total HpCDD	460		
Total TCDF	5060	5080	Empc
Total PeCDF	5710	5720	Empc
Total HxCDF	10800		
Total HpCDF	15600		

Toxic Equivalent Quotient (TEQ) Data [e]

TEQ (Min): 14300

a. Sample specific estimated detection limit.

b. Estimated maximum possible concentration.

c. Method detection limit.

d. Lower control limit - upper control limit.

e. TEQ based on (2005) World Health Organization Toxic Equivalent Factors.(WHO)

Analyst: ANP

Approved By: Calvin Tanaka 29-May-2012 12:57

Sample ID:	PRR1WATCME-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-001	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.949 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12	%Solids: 1.01	Date Analyzed DB-1 25-May-12	
Time Collected:	1130			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	6.83	5.27	
PCB-2	ND	5.27	
PCB-3	ND	5.27	
PCB-4/10	ND	10.5	
PCB-5/8	16.8	10.5	
PCB-6	ND	10.5	
PCB-7/9	10.8	10.5	
PCB-11	ND ~~29.8~~	~~10.5~~ 29.8	U B
PCB-12/13	25.3	10.5	
PCB-14	13.8	10.5	
PCB-15	ND	10.5	
PCB-16/32	8.13	5.27	
PCB-17	ND	5.27	
PCB-18	9.97	5.27	
PCB-19	ND	5.27	
PCB-20/21/33	13.4	5.27	
PCB-22	5.62	5.27	
PCB-23	ND	5.27	
PCB-24/27	7.48	5.27	
PCB-25	ND	5.27	
PCB-26	ND	5.27	
PCB-28	14.8	5.27	
PCB-29	ND	5.27	
PCB-30	ND	5.27	
PCB-31	12.4	5.27	
PCB-34	ND	5.27	
PCB-35	ND	5.27	
PCB-36	ND	5.27	
PCB-37	11.0	5.27	
PCB-38	ND	5.27	
PCB-39	ND	5.27	
PCB-40	ND	5.27	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-41/64/71/72	11.2	5.27	
PCB-42/59	ND	5.27	
PCB-43/49	8.95	5.27	
PCB-44	9.49	5.27	
PCB-45	ND	5.27	
PCB-46	ND	5.27	
PCB-47	5.40	5.27	
PCB-48/75	ND	5.27	
PCB-50	ND	5.27	
PCB-51	ND	5.27	
PCB-52/69	ND ~~12.4~~	~~5.27~~ 12.4	UB
PCB-53	ND	5.27	
PCB-54	ND	5.27	
PCB-55	ND	5.27	
PCB-56/60	8.41	5.27	
PCB-57	ND	5.27	
PCB-58	ND	5.27	
PCB-61/70	ND ~~14.3~~	~~5.27~~ 14.3	UB
PCB-62	ND	5.27	
PCB-63	ND	5.27	
PCB-65	ND	5.27	
PCB-67	ND	5.27	
PCB-68	ND	5.27	
PCB-73	ND	5.27	
PCB-74	12.6	5.27	
PCB-76/66	13.0	5.27	
PCB-77	ND ~~3.91~~	5.27	UB ~~J,B~~
PCB-78	ND	5.27	
PCB-79	ND	5.27	
PCB-80	ND	5.27	
PCB-81	0.369	5.27	J
PCB-82	ND	5.27	

Sample ID:	PRR1WATCME-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-001	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.949 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12	%Solids: 1.01	Date Analyzed DB-1 25-May-12	
Time Collected:	1130			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	ND	5.27	
PCB-84/92	ND ~~7.77~~	~~5.27~~ 7.77	U B
PCB-85/116	ND	5.27	
PCB-86	ND	5.27	
PCB-87/117/125	ND ~~6.75~~	~~5.27~~ 6.75	U B
PCB-88/91	ND	5.27	
PCB-89	ND	5.27	
PCB-90/101	ND ~~18.1~~	~~5.27~~ 18.1	U B
PCB-93	ND	5.27	
PCB-94	ND	5.27	
PCB-95/98/102	ND ~~14.8~~	~~5.27~~ 14.8	U B
PCB-96	ND	5.27	
PCB-97	ND	5.27	
PCB-99	ND ~~13.1~~	~~5.27~~ 13.1	U B
PCB-100	ND	5.27	
PCB-103	ND	5.27	
PCB-104	ND	5.27	
PCB-105	ND ~~7.94~~	~~5.27~~ 7.94	U B
PCB-106/118	ND ~~28.0~~	~~5.27~~ 28.0	U B
PCB-107/109	ND	5.27	
PCB-108/112	ND	5.27	
PCB-110	ND ~~18.7~~	~~5.27~~ 18.7	U B
PCB-111/115	ND	5.27	
PCB-113	ND	5.27	
PCB-114	5.73	5.27	
PCB-119	ND	5.27	
PCB-120	ND	5.27	
PCB-121	ND	5.27	
PCB-122	ND	5.27	
PCB-123	ND ~~1.44~~	5.27	UB ~~J,B~~
PCB-124	ND	5.27	
PCB-126	ND	1.98	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-127	ND	5.27	
PCB-128/162	4.43	5.27	J
PCB-129	ND	5.27	
PCB-130	ND	5.27	
PCB-131	ND	5.27	
PCB-132/161	7.04	5.27	
PCB-133/142	ND	5.27	
PCB-134/143	ND	5.27	
PCB-135	ND	5.27	
PCB-136	ND	5.27	
PCB-137	ND	5.27	
PCB-138/163/164	ND ~~25.5~~	~~5.27~~ 25.5	U B
PCB-139/149	ND ~~14.0~~	~~5.27~~ 14.0	U B
PCB-140	ND	5.27	
PCB-141	8.60	5.27	
PCB-144	ND	5.27	
PCB-145	ND	5.27	
PCB-146/165	ND	5.27	
PCB-147	ND	5.27	
PCB-148	ND	5.27	
PCB-150	ND	5.27	
PCB-151	ND	5.27	
PCB-152	ND	5.27	
PCB-153	ND ~~26.9~~	~~5.27~~ 26.9	U B
PCB-154	ND	5.27	
PCB-155	ND	5.27	
PCB-156	13.3	5.27	
PCB-157	ND	1.82	
PCB-158/160	ND	5.27	
PCB-159	ND	5.27	
PCB-166	ND	5.27	
PCB-167	ND	3.45	

Sample ID:	PRR1WATCME-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-001	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.949 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12	%Solids: 1.01	Date Analyzed DB-1 25-May-12	
Time Collected:	1130			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	5.27	
PCB-169	ND	0.857	~~*~~
PCB-170	ND	10.6	~~I~~ J
PCB-171	ND	5.27	
PCB-172	ND	5.27	
PCB-173	ND	5.27	
PCB-174	16.4	5.27	
PCB-175	ND	5.27	
PCB-176	ND	5.27	
PCB-177	6.56	5.27	
PCB-178	ND	5.27	
PCB-179	6.01	5.27	
PCB-180	38.2	5.27	
PCB-181	ND	5.27	
PCB-182/187	19.2	5.27	
PCB-183	7.47	5.27	
PCB-184	ND	5.27	
PCB-185	ND	5.27	
PCB-186	ND	5.27	
PCB-188	ND	5.27	
PCB-189	5.03	5.27	J
PCB-190	ND	9.56	~~I~~ J
PCB-191	ND	5.27	
PCB-192	ND	5.27	
PCB-193	ND	5.27	
PCB-194	23.4	5.27	
PCB-195	6.08	5.27	
PCB-196/203	34.4	5.27	
PCB-197	ND	5.27	
PCB-198	ND	5.27	
PCB-199	34.0	5.27	
PCB-200	ND	5.27	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	ND	5.27	
PCB-202	13.6	5.27	
PCB-204	ND	5.27	
PCB-205	ND	17.9	~~I~~ J
PCB-206	78.2	5.27	
PCB-207	ND	8.16	~~I~~ J
PCB-208	25.4	5.27	
PCB-209	1110	5.27	
Total monoCB	6.83	5.27	
Total diCB	~~ND 96.5~~	~~10.5~~ 96.5	UB
Total triCB	82.8	5.27	
Total tetraCB	100	5.27	~~B~~
Total pentaCB	~~ND 122~~	~~5.27~~ 122	UB
Total hexaCB	~~ND 99.8~~	~~5.27~~ 99.8	UB
Total heptaCB	99.0	5.27	
Total octaCB	111	5.27	
Total nonaCB	104	5.27	
Total decaCB	1110	5.27	
Total PCB	1930	10.5	~~B~~

TEQ(WHO-2005 Mammal [(Min)]: 0.00235

Sample ID:	PRR1WATCME-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-001	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.949 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12		Date Analyzed 25-May-12	
Time Collected:	1130			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-1	80.1	25	150	
	13C-PCB-3	78.1	25	150	
	13C-PCB-4	66.4	25	150	
	13C-PCB-11	78.3	25	150	
	13C-PCB-9	73.5	25	150	
	13C-PCB-19	68.9	25	150	
	13C-PCB-28	76.8	25	150	
	13C-PCB-32	65.0	25	150	
	13C-PCB-37	109	25	150	
	13C-PCB-47	66.3	25	150	
	13C-PCB-52	68.0	25	150	
	13C-PCB-54	56.2	25	150	
	13C-PCB-70	78.8	25	150	
	13C-PCB-77	81.2	25	150	
	13C-PCB-80	79.6	25	150	
	13C-PCB-81	78.5	25	150	
	13C-PCB-95	74.1	25	150	
	13C-PCB-97	74.9	25	150	
	13C-PCB-101	75.3	25	150	
	13C-PCB-104	67.3	25	150	
	13C-PCB-105	78.6	25	150	
	13C-PCB-114	76.2	25	150	
	13C-PCB-118	77.6	25	150	
	13C-PCB-123	78.4	25	150	
	13C-PCB-126	83.6	25	150	
	13C-PCB-127	83.8	25	150	
	13C-PCB-138	77.4	25	150	
	13C-PCB-141	77.8	25	150	
	13C-PCB-153	77.0	25	150	
	13C-PCB-155	57.3	25	150	

Chemist: MAS

Approved by: Martha M. Maier 30-May-2012 14:06

Sample ID:	PRR1WATCME-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-001	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.949 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12		Date Analyzed 25-May-12	
Time Collected:	1130			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-156	78.6	25	150	
	13C-PCB-157	78.2	25	150	
	13C-PCB-159	79.0	25	150	
	13C-PCB-167	79.0	25	150	
	13C-PCB-169	80.8	25	150	
	13C-PCB-170	64.0	25	150	
	13C-PCB-180	64.5	25	150	
	13C-PCB-188	65.7	25	150	
	13C-PCB-189	65.9	25	150	
	13C-PCB-194	72.7	25	150	
	13C-PCB-202	52.9	25	150	
	13C-PCB-206	74.1	25	150	
	13C-PCB-208	76.2	25	150	
	13C-PCB-209	65.6	25	150	
CRS	13C-PCB-79	88.2	30	135	
	13C-PCB-178	75.0	30	135	

Chemist: MAS

Approved by: Martha M. Maier 30-May-2012 14:06

Sample ID:	PRR1WATCMI-54			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33802-002	Date Received:	24-May-12
Project:	PRR1306	Sample Size:	0.971 L	QC Batch No.:	4456	Date Extracted:	24-May-12
Date Collected:	23-May-12	%Solids:	1.03	Date Analyzed DB-1	25-May-12		
Time Collected:	1145						

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-1	99000	103	D	PCB-41/64/71/72	1280	103	D
PCB-2	50400	103	D	PCB-42/59	391	103	D
PCB-3	24500	103	D	PCB-43/49	997	103	D
PCB-4/10	11200	206	D	PCB-44	1210	103	D
PCB-5/8	21600	206	D	PCB-45	228	103	D
PCB-6	7400	206	D	PCB-46	ND	103	D
PCB-7/9	15700	206	D	PCB-47	412	103	D
PCB-11	6950	206	~~B~~,D	PCB-48/75	ND	307	D,~~I~~ J
PCB-12/13	35300	206	D	PCB-50	ND	103	D
PCB-14	11600	206	D	PCB-51	78.6	103	D,J
PCB-15	3680	206	D	PCB-52/69	1280	103	~~B~~,D
PCB-16/32	1470	103	D	PCB-53	214	103	D
PCB-17	921	103	D	PCB-54	ND	103	D
PCB-18	3350	103	D	PCB-55	ND	103	D
PCB-19	229	103	D	PCB-56/60	930	103	D
PCB-20/21/33	3610	103	D	PCB-57	ND	103	D
PCB-22	1290	103	D	PCB-58	ND	103	D
PCB-23	786	103	D	PCB-61/70	1270	103	~~B~~,D
PCB-24/27	3500	103	D	PCB-62	ND	103	D
PCB-25	222	103	D	PCB-63	ND	103	D
PCB-26	1870	103	D	PCB-65	ND	103	D
PCB-28	3860	103	D	PCB-67	ND	103	D
PCB-29	426	103	D	PCB-68	ND	103	D
PCB-30	183	103	D	PCB-73	ND	103	D
PCB-31	3110	103	D	PCB-74	1790	103	D
PCB-34	500	103	D	PCB-76/66	1300	103	D
PCB-35	955	103	D	PCB-77	225	103	~~B~~,D
PCB-36	285	103	D	PCB-78	ND	103	D
PCB-37	3460	103	D	PCB-79	ND	135	D,~~I~~ J
PCB-38	103	103	D	PCB-80	ND	103	D
PCB-39	632	103	D	PCB-81	59.7	103	D,J
PCB-40	ND	103	D	PCB-82	120	5.15	

Sample ID:	PRR1WATCMI-54			EPA Method 1668A			
Client Data		**Sample Data**		**Laboratory Data**			
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33802-002	Date Received:	24-May-12
Project:	PRR1306	Sample Size:	0.971 L	QC Batch No.:	4456	Date Extracted:	24-May-12
Date Collected:	23-May-12	%Solids:	1.03	Date Analyzed DB-1	25-May-12		
Time Collected:	1145						

Analyte	Conc. (pg/L)	RL	Qualifiers	Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-83	11.5	5.15		PCB-127	ND	5.15	
PCB-84/92	442	5.15	~~B~~	PCB-128/162	ND	232	~~I~~ J
PCB-85/116	143	5.15		PCB-129	58.2	5.15	
PCB-86	55.9	5.15		PCB-130	48.0	5.15	
PCB-87/117/125	366	5.15	~~B~~	PCB-131	22.1	5.15	
PCB-88/91	144	5.15		PCB-132/161	177	5.15	
PCB-89	24.3	5.15		PCB-133/142	27.6	5.15	
PCB-90/101	956	5.15	~~B~~	PCB-134/143	37.9	5.15	
PCB-93	ND	5.15		PCB-135	104	5.15	
PCB-94	11.8	5.15		PCB-136	120	5.15	
PCB-95/98/102	756	5.15	~~B~~	PCB-137	50.2	5.15	
PCB-96	12.8	5.15		PCB-138/163/164	825	5.15	~~B~~
PCB-97	267	5.15	~~B~~	PCB-139/149	585	5.15	~~B~~
PCB-99	767	5.15	~~B~~	PCB-140	ND	5.15	
PCB-100	13.3	5.15		PCB-141	339	5.15	
PCB-103	18.1	5.15		PCB-144	59.5	5.15	
PCB-104	ND	5.15		PCB-145	ND	5.15	
PCB-105	423	5.15	~~B~~	PCB-146/165	109	5.15	
PCB-106/118	1600	5.15	~~B~~	PCB-147	16.3	5.15	
PCB-107/109	95.4	5.15		PCB-148	ND	6.29	~~I~~ J
PCB-108/112	59.3	5.15		PCB-150	8.48	5.15	
PCB-110	1010	5.15	~~B~~	PCB-151	182	5.15	
PCB-111/115	79.6	5.15		PCB-152	ND	5.15	
PCB-113	5.35	5.15		PCB-153	880	5.15	~~B~~
PCB-114	426	5.15		PCB-154	38.8	5.15	
PCB-119	42.9	5.15		PCB-155	14.0	5.15	
PCB-120	7.74	5.15		PCB-156	497	5.15	
PCB-121	ND	5.15		PCB-157	50.7	5.15	
PCB-122	ND	5.15		PCB-158/160	169	5.15	
PCB-123	72.3	5.15	~~B~~	PCB-159	ND	5.15	
PCB-124	68.2	5.15		PCB-166	86.1	5.15	
PCB-126	39.8	5.15		PCB-167	130	5.15	

Sample ID:	PRR1WATCMI-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-002	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.971 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12	%Solids: 1.03	Date Analyzed DB-1 25-May-12	
Time Collected:	1145			

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-168	ND	5.15	
PCB-169	ND	7.54	~~I~~ J
PCB-170	341	5.15	
PCB-171	71.4	5.15	
PCB-172	87.6	5.15	
PCB-173	23.4	5.15	
PCB-174	355	5.15	
PCB-175	30.0	5.15	
PCB-176	ND	5.15	
PCB-177	140	5.15	
PCB-178	91.1	5.15	
PCB-179	172	5.15	
PCB-180	1140	5.15	
PCB-181	10.3	5.15	
PCB-182/187	599	5.15	
PCB-183	263	5.15	
PCB-184	11.4	5.15	
PCB-185	113	5.15	
PCB-186	ND	5.15	
PCB-188	7.55	5.15	
PCB-189	179	5.15	
PCB-190	ND	573	~~I~~ J
PCB-191	35.6	5.15	
PCB-192	7.20	5.15	
PCB-193	41.6	5.15	
PCB-194	685	5.15	
PCB-195	172	5.15	
PCB-196/203	926	5.15	
PCB-197	29.1	5.15	
PCB-198	67.1	5.15	
PCB-199	766	5.15	
PCB-200	86.0	5.15	

Analyte	Conc. (pg/L)	RL	Qualifiers
PCB-201	93.2	5.15	
PCB-202	276	5.15	
PCB-204	6.16	5.15	
PCB-205	ND	172	~~I~~ J
PCB-206	2110	5.15	
PCB-207	238	5.15	
PCB-208	517	5.15	
PCB-209	71100	5.15	E ~~J~~
Total monoCB	174000	103	
Total diCB	113000	206	~~B~~
Total triCB	30800	103	
Total tetraCB	11700	103	~~B~~
Total pentaCB	8040	5.15	~~B~~
Total hexaCB	4630	5.15	~~B~~
Total heptaCB	3720	5.15	
Total octaCB	3110	5.15	
Total nonaCB	2860	5.15	
Total decaCB	71100	5.15	J
Total PCB	423000	206	~~B~~ J

TEQ(WHO-2005 Mammal [(Min)]: **4.12**

Sample ID:	PRR1WATCMI-54				EPA Method 1668A
Client Data		**Sample Data**		**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix:	Aqueous	Lab Sample:	33802-002
Project:	PRR1306	Sample Size:	0.971 L	QC Batch No.:	4456
Date Collected:	23-May-12			Date Analyzed	25-May-12
Time Collected:	1145			Date Received:	24-May-12
				Date Extracted:	24-May-12

	Internal Standard	% Recovery	LCL	UCL	Qualifier
IS	13C-PCB-1	105	25	150	D
	13C-PCB-3	97.8	25	150	D
	13C-PCB-4	85.6	25	150	D
	13C-PCB-11	83.0	25	150	D
	13C-PCB-9	90.9	25	150	D
	13C-PCB-19	78.5	25	150	D
	13C-PCB-28	77.6	25	150	D
	13C-PCB-32	97.6	25	150	D
	13C-PCB-37	98.9	25	150	D
	13C-PCB-47	63.2	25	150	D
	13C-PCB-52	56.9	25	150	D
	13C-PCB-54	54.0	25	150	D
	13C-PCB-70	77.8	25	150	D
	13C-PCB-77	80.1	25	150	D
	13C-PCB-80	71.3	25	150	D
	13C-PCB-81	73.6	25	150	D
	13C-PCB-95	75.9	25	150	
	13C-PCB-97	75.4	25	150	
	13C-PCB-101	69.8	25	150	
	13C-PCB-104	87.7	25	150	
	13C-PCB-105	59.9	25	150	
	13C-PCB-114	52.0	25	150	
	13C-PCB-118	78.9	25	150	
	13C-PCB-123	77.5	25	150	
	13C-PCB-126	65.9	25	150	
	13C-PCB-127	59.0	25	150	
	13C-PCB-138	79.3	25	150	
	13C-PCB-141	75.3	25	150	
	13C-PCB-153	77.9	25	150	
	13C-PCB-155	61.0	25	150	

Sample ID:	PRR1WATCMI-54			EPA Method 1668A
Client Data		**Sample Data**	**Laboratory Data**	
Name:	ARCADIS U.S., Inc.	Matrix: Aqueous	Lab Sample: 33802-002	Date Received: 24-May-12
Project:	PRR1306	Sample Size: 0.971 L	QC Batch No.: 4456	Date Extracted: 24-May-12
Date Collected:	23-May-12		Date Analyzed 25-May-12	
Time Collected:	1145			

	Internal Standard	% Recovery	LCL - UCL		Qualifier
IS	13C-PCB-156	86.0	25	150	
	13C-PCB-157	87.0	25	150	
	13C-PCB-159	79.5	25	150	
	13C-PCB-167	82.2	25	150	
	13C-PCB-169	96.1	25	150	
	13C-PCB-170	87.8	25	150	
	13C-PCB-180	87.4	25	150	
	13C-PCB-188	69.7	25	150	
	13C-PCB-189	97.1	25	150	
	13C-PCB-194	74.5	25	150	
	13C-PCB-202	82.3	25	150	
	13C-PCB-206	91.4	25	150	
	13C-PCB-208	89.3	25	150	
	13C-PCB-209	103	25	150	
CRS	13C-PCB-79	81.0	30	135	
	13C-PCB-178	88.9	30	135	

Chemist: MAS

Approved by: Martha M. Maier 30-May-2012 14:06

ARCADIS

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

33802 1.1°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1306	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-54	5/23/2012	11:30	water	Grab	4	X	X																
PRR1WATCMI-54	5/23/2012	11:45	water	Grab	4	X	X																

Requested Analyses	
1	Dioxins (17 Isomers) and Total PCDD/PCDFs
2	Congener PCBs (Total)
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

Refer to RAWP QAPP WS 15-4 for Effluent Samples and WS 15-5 for Effluent Samples

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Kevin Ganellin	05/23/12	1800	5/24/12 0835			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1307 (200-10948)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17540R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1307 (200-10948) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-25-SP-105	200-10948-1	Water	5/23/2012		X				
PRR1WATGACE-25-SP-106	200-10948-2	Water	5/23/2012		X				
PRR1WATGACE-25-SP-109	200-10948-3	Water	5/23/2012		X				
PRR1WAT-25-SP-101	200-10948-4	Water	5/23/2012						X
TB05232012-A	200-10948-5	Water	5/23/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-25-SP-105	Chlorobenzene	13000 E	12000 D	12000 D
PRR1WATGACE-25-SP-106	Chlorobenzene	2300 E	2200 D	2200 D
PRR1WATGACE-25-SP-109	Chlorobenzene	860 E	710 D	710 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 13, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1307 - VOCs

ANALYTE	Units	PRR1WATGACE-25-SP-106	LQ	VQ	PRR1WATGACE-25-SP-109	LQ	VQ	PRR1WATGACI-25-SP-105	LQ	VQ
2-Butanone	ug/L	88	J	J	13	J	J	590	U	U
Chlorobenzene	ug/L	2200	D	D	710	D	D	12000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1307 - Miscellaneous

ANALYTE	Units	PRR1WAT-25-SP-101	LQ	VQ
Total Suspended Solids	mg/L	25.8		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-25-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 20.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	88	J
108-90-7	Chlorobenzene	2200 ~~2300~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-25-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 141.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	97	J D
108-90-7	Chlorobenzene	2200	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-25-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO24.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 7.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	13	J
108-90-7	Chlorobenzene	710 ~~860~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-25-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO23.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 52.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	18	J D
108-90-7	Chlorobenzene	710	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-25-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 118.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	590	U
108-90-7	Chlorobenzene	12000 ~~13000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACI-25-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 880.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	4400	U
108-90-7	Chlorobenzene	12000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05232012-A

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1307

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10948-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIO26.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/24/2012

% Moisture: not dec. Date Analyzed: 05/24/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.090	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-25-SP-101 Lab Sample ID: 200-10948-4

Lab Name: TestAmerica Burlington Job No.: 200-10948-2

SDG ID.: PRR1307

Matrix: Water Date Sampled: 05/23/2012 12:00

Reporting Basis: WET Date Received: 05/24/2012 08:15

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	25.8	1.9		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1307	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-25-SP-105	5/23/2012	12:00	water	Grab	3	X																	
PRR1WATGACE-25-SP-106	5/23/2012	12:00	water	Grab	9	X																	MS/MSD
PRR1WATGACE-25-SP-109	5/23/2012	12:00	water	Grab	3	X																	
PRR1WAT-25-SP-101	5/23/2012	12:00	water	Grab	1		X																
TB05232012-A	5/23/2012		water	_	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 1.8°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	5/23/12	1215	Kevin Gardini		5/24/12 0815	[signature] TA Del
Relinquished by: Kevin Gardini	DATE 05/23/12	TIME 1800	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/25/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1310 (200-10971)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17543R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1310 (200-10971) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-26-SP-105	200-10971-1	Water	5/24/2012		X				
PRR1WATGAC-26-SP-106	200-10971-2	Water	5/24/2012		X				
PRR1WATGAC-26-SP-109	200-10971-3	Water	5/24/2012		X				
PRR1WATGAC-26-SP-107	200-10971-4	Water	5/24/2012		X				
PRR1WATGAC-26-SP-108	200-10971-5	Water	5/24/2012		X				
PRR1WATCME-55	200-10971-6	Water	5/24/2012						X
PRR1WAT-26-SP-101	200-10971-7	Water	5/24/2012						X
TB05242012-A	200-10971-8	Water	5/24/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-26-SP-105	Chlorobenzene	10000 E	9700 D	9700 D
PRR1WATGAC-26-SP-106	Chlorobenzene	3200 E	2600 D	2600 D
PRR1WATGAC-26-SP-109	Chlorobenzene	1900 E	1500 D	1500 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 13, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1310 - VOCs

ANALYTE	Units	PRR1WATGAC-26-SP-106	LQ	VQ	PRR1WATGAC-26-SP-107	LQ	VQ	PRR1WATGAC-26-SP-108	LQ	VQ
2-Butanone	ug/L	78	J	J	62			26		
Chlorobenzene	ug/L	2600	D	D	3.2			3.8		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1310 - VOCs

ANALYTE	Units	PRR1WATGAC-26-SP-109	LQ	VQ	PRR1WATGACI-26-SP-105	LQ	VQ
2-Butanone	ug/L	28	J	J	67	J	J
Chlorobenzene	ug/L	1500	D	D	9700	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1310 - Miscellaneous

ANALYTE	Units	PRR1WAT-26-SP-101	LQ	VQ	PRR1WATCME-55	LQ	VQ
Total Suspended Solids	mg/L	34.7			4.7		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGAC-26-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 31.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	78	J
108-90-7	Chlorobenzene	2600 ~~3200~~	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGAC-26-SP-106DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 231.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1200	U
108-90-7	Chlorobenzene	2600	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGAC-26-SP-107

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	62	
108-90-7	Chlorobenzene	3.2	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGAC-26-SP-108

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 2.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	26	
108-90-7	Chlorobenzene	3.8	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGAC-26-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 19.1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	28	J
108-90-7	Chlorobenzene	1500 ~~1900~~ ~~E~~ D	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGAC-26-SP-109DL

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 133.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	670	U
108-90-7	Chlorobenzene	1500	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-26-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 102.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	67	J
108-90-7	Chlorobenzene	9700 ~~10000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-26-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 733.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	3700	U
108-90-7	Chlorobenzene	9700	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05242012-A

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1310

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-10971-8

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOB17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/25/2012

% Moisture: not dec. Date Analyzed: 05/25/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.044	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-55 Lab Sample ID: 200-10971-6

Lab Name: TestAmerica Burlington Job No.: 200-10971-2

SDG ID.: PRR1310

Matrix: Water Date Sampled: 05/24/2012 08:55

Reporting Basis: WET Date Received: 05/25/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	4.7	2.0		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-26-SP-101 Lab Sample ID: 200-10971-7

Lab Name: TestAmerica Burlington Job No.: 200-10971-2

SDG ID.: PRR1310

Matrix: Water Date Sampled: 05/24/2012 09:15

Reporting Basis: WET Date Received: 05/25/2012 09:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	34.7	1.9		mg/L			1	SM 2540D

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Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
80009966.0002.70004	Tierra Phase I Removal	PRR1310	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
						Requested Analyses																	
PRR1WATGACI-26-SP-105	5/24/2012	9:12	water	Grab	3	X																	
PRR1WATGACE-26-SP-106	5/24/2012	9:09	water	Grab	9	X																	
PRR1WATGACE-26-SP-109	5/24/2012	9:05	water	Grab	3	X																	
PRR1WATGACE-26-SP-107	5/24/2012	9:07	water	Grab	3	X																	
PRR1WATGACE-26-SP-108	5/24/2012	9:00	water	Grab	3	X																	
PRR1WATCME-55	5/24/2012	8:55	water	Grab	1		X																
PRR1WAT-26-SP-101	5/24/2012	9:15	water	Grab	1		X																
TB05242012-A	5/24/2012		water	_	3	X																	

Page 7 of 165

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

☐ Cooler packed with ice

Sample Receipt:

Shipping Tracking #

☐ Cooler custody seal intact

Condition/Cooler Temp:

Specify Turnaround Requirements: 24 hr TAT

	Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
7							
8							
9	Liz Burns	5/24/12	1255	Craig A. Burnap			
10	Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
11				5/25/12			
12	Craig A. Burnap	5/24/12	1430	0900			
13	Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
14							
15							

05/29/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1342 (200-11148-1&2)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17600R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1342 (200-11148-1&2) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATGACI-31-SP-105	200-11148-1	Water	6/6/2012		X				
PRR1WATGACE-31-SP-107	200-11148-2	Water	6/6/2012		X				
PRR1WATGACE-31-SP-108	200-11148-3	Water	6/6/2012		X				
PRR1WAT-31-SP-101	200-11148-4	Water	6/6/2012						X
TB06062012	200-11148-5	Water	6/6/2012		X				

1. Volatiles by USEPA SOM0.1.2
2. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D and/or Chemical Oxygen Demand (COD) by EPA Method 410.4

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analysis performed on the sample in this sample delivery group was done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during volatiles analysis. Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. No qualification of the sample results was required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited surrogate recoveries within the established acceptance limits for all surrogates associated with target compounds.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

A MS/MSD analysis was not performed on a sample location associated with this SDG.

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 100% for soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

6. REPORTING

One target compound was reported from a diluted analysis and was flagged with a "D." The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

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
PRR1WATGACI-31-SP-105	Chlorobenzene	9000 E	7000 D	7000 D
PRR1WATGACE-31-SP-107	Chlorobenzene	6400 E	6000 D	6000 D
PRR1WATGACE-31-SP-108	Chlorobenzene	11000 E	11000 D	11000 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

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

A MS analysis was not performed on a sample location associated with this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location associated with this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

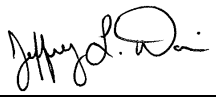
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: October 16, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 31, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1342 - VOCs

ANALYTE	Units	PRR1WATGACE-31-SP-107	LQ	VQ	PRR1WATGACE-31-SP-108	LQ	VQ	PRR1WATGACI-31-SP-105	LQ	VQ
2-Butanone	ug/L	2700			3200			3100		
Chlorobenzene	ug/L	6000	D	D	11000	D	D	7000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1342 - Miscellaneous

ANALYTE	Units	PRR1WAT-31-SP-101	LQ	VQ
Total Suspended Solids	mg/L	43.3		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-31-SP-107

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 62.8

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	2700	
108-90-7	Chlorobenzene	6000 ~~6400~~ E D	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-31-SP-107D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 440.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	2800	D
108-90-7	Chlorobenzene	6000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-31-SP-108

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 95.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	3200	
108-90-7	Chlorobenzene	11000 ~~11000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-31-SP-108D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 666.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	3200	J D
108-90-7	Chlorobenzene	11000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-31-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 73.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	3100	
108-90-7	Chlorobenzene	7000 ~~9000~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-31-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 550.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	2500	J D
108-90-7	Chlorobenzene	7000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB06062012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1342

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11148-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPE15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/07/2012

% Moisture: not dec. Date Analyzed: 06/07/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.092	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-31-SP-101 Lab Sample ID: 200-11148-4

Lab Name: TestAmerica Burlington Job No.: 200-11148-2

SDG ID.: PRR1342

Matrix: Water Date Sampled: 06/06/2012 09:00

Reporting Basis: WET Date Received: 06/07/2012 09:05

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	43.3	2.1		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

06/11/2012

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1342	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-31-SP-105	6/6/2012	8:58	water	Grab	3	X																	
PRR1WATGACE-31-SP-107	6/6/2012	8:48	water	Grab	3	X																	
PRR1WATGACE-31-SP-108	6/6/2012	8:43	water	Grab	3	X																	
PRR1WAT-31-SP-101	6/6/2012	9:00	water	Grab	1		X																
TB06062012	6/6/2012		water	-	3	X																	

Requested Analyses	
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Special Instructions/Comments:

☐ Special QA/QC instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	6/6/12	1420	[signature]			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	6/6/12	1431	[signature] 6/7/12 0905			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Miscellaneous Analysis

SDG# PRR1353 (200-11343)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17610R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1353 (200-11343) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	SVOA	PEST/ PCBs	MET	MISC
PRR1WATCME-64	200-11343-1	Water	6/7/2012						X
PRR1WATCME-65	200-11343-2	Water	6/8/2012						X
PRR1WATCME-66	200-11343-3	Water	6/9/2012						X
PRR1WATCME-67	200-11343-4	Water	6/11/2012						X
PRR1WATCME-68	200-11343-5	Water	6/12/2012						X

1. Miscellaneous analyses include Total Suspended Solids (TSS) by SM 2540D.

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Three samples were analyzed beyond the method prescribed hiding time.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

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

Sample Locations	Holding Time	Criteria
PRR1WATCME-64	Analysis completed in 11 Days	7 Days
PRR1WATCME-65	Analysis completed in 10 Days	7 Days
PRR1WATCME-66	Analysis completed in 9 Days	7 Days

Sample results associated with sample locations analyzed by analytical method 2540D were qualified, as specified in the table below. All other holding times were met.

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

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the

method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

A MS analysis was not performed on a sample location associated with this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

A duplicate analysis was not performed on a sample location associated with this SDG.

6. FIELD DUPLICATE

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 soil matrices is applied to the RPD between the parent sample and the field duplicate.

A field duplicate was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

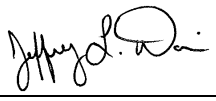
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: October 16, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 31, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1353 - Miscellaneous

ANALYTE	Units	PRR1WATCME-64	LQ	VQ	PRR1WATCME-65	LQ	VQ	PRR1WATCME-66	LQ	VQ
Total Suspended Solids	mg/L	15.1	H	J	17.4	H	J	8.5	H	J

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1353 - Miscellaneous

ANALYTE	Units	PRR1WATCME-67	LQ	VQ	PRR1WATCME-68	LQ	VQ
Total Suspended Solids	mg/L	8.8			11.2		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-64 Lab Sample ID: 200-11343-1

Lab Name: TestAmerica Burlington Job No.: 200-11343-1

SDG ID.: PRR1353

Matrix: Water Date Sampled: 06/07/2012 12:00

Reporting Basis: WET Date Received: 06/16/2012 10:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	15.1	1.9		mg/L		~~H~~ J	1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-65 Lab Sample ID: 200-11343-2

Lab Name: TestAmerica Burlington Job No.: 200-11343-1

SDG ID.: PRR1353

Matrix: Water Date Sampled: 06/08/2012 17:10

Reporting Basis: WET Date Received: 06/16/2012 10:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	17.4	1.9		mg/L		~~H~~ J	1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-66 | Lab Sample ID: 200-11343-3

Lab Name: TestAmerica Burlington | Job No.: 200-11343-1

SDG ID.: PRR1353

Matrix: Water | Date Sampled: 06/09/2012 17:07

Reporting Basis: WET | Date Received: 06/16/2012 10:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	8.5	1.9		mg/L		#J	1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-67 Lab Sample ID: 200-11343-4

Lab Name: TestAmerica Burlington Job No.: 200-11343-1

SDG ID.: PRR1353

Matrix: Water Date Sampled: 06/11/2012 10:00

Reporting Basis: WET Date Received: 06/16/2012 10:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	8.8	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-68 Lab Sample ID: 200-11343-5

Lab Name: TestAmerica Burlington Job No.: 200-11343-1

SDG ID.: PRR1353

Matrix: Water Date Sampled: 06/12/2012 11:00

Reporting Basis: WET Date Received: 06/16/2012 10:00

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	11.2	1.9		mg/L			1	SM 2540D

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CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1353	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATCME-64	6/7/2012	12:00	water	Grab	1	X																	
PRR1WATCME-65	6/8/2012	17:10	water	Grab	1	X																	
PRR1WATCME-66	6/9/2012	17:07	water	Grab	1	X																	
PRR1WATCME-67	6/11/2012	10:00	water	Grab	1	X																	
PRR1WATCME-68	6/12/2012	11:00	water	Grab	1	X																	

Requested Analyses	
1	TSS
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	6/15/2012	1230				[signature] 6-16-12 10:00
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

06/21/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analysis

SDG# PRR1355 (2110001)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #18045R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1355 (2110001) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	PEST	PCBs	PCDD/ PCDF	MISC
PRR1SOLPC-13	2110001-001	Soil	11/20/2012					X	
PRR1SOLPC-14	2110001-002	Soil	11/20/2012					X	

1. PCDD/PCDF – Dioxins/Furans by USEPA 1613

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

The samples in this SDG were received at a temperature of 12.7 degrees C.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

The samples in this SDG were received at a temperature of 12.7 degrees C, which is outside the method prescribed criteria. Therefore, the associated sample results are qualified as estimated (J).

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the

analytical procedure.

5. SECOND COLUMN CONFIRMATION

The compound 2,3,7,8-TCDF was not detected in either sample. Therefore, confirmation analysis was not performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

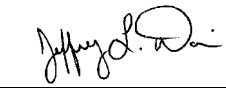
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: December 13, 2102

PEER REVIEW BY: Joseph C. Houser

DATE: December 14, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1355 - Dioxins/Furans

ANALYTE	Units	PRR1SOLPC-13	LQ	VQ	PRR1SOLPC-14	LQ	VQ
2,3,7,8-TCDD	pg/g	0.102	EMPC	J EMPC	0.188	U	UJ
1,2,3,7,8-PeCDD	pg/g	0.346	U	UJ	0.278	U	UJ
1,2,3,4,7,8-HxCDD	pg/g	0.238	U	UJ	0.272	U	UJ
1,2,3,6,7,8-HxCDD	pg/g	0.282	U	UJ	0.294	U	UJ
1,2,3,7,8,9-HxCDD	pg/g	0.285	U	UJ	0.301	U	UJ
1,2,3,4,6,7,8-HpCDD	pg/g	0.819	U	UJ	0.525	U	UJ
OCDD	pg/g	7.23		J	2.2	J	J
Total TCDD	pg/g	0.264		J	0.13		J
Total PeCDD	pg/g	0.346	U	UJ	0.278	U	UJ
Total HxCDD	pg/g	0.406	U	UJ	0.476	U	UJ
Total HpCDD	pg/g	0.819	U	UJ	0.525	U	UJ
2,3,7,8-TCDF	pg/g	0.236	U	UJ	0.109	U	UJ
1,2,3,7,8-PeCDF	pg/g	0.188	U	UJ	0.18	U	UJ
2,3,4,7,8-PeCDF	pg/g	0.104	EMPC	J EMPC	0.182	U	UJ
1,2,3,4,7,8-HxCDF	pg/g	0.1	U	UJ	0.0754	U	UJ
1,2,3,6,7,8-HxCDF	pg/g	0.187	U	UJ	0.0813	U	UJ
1,2,3,7,8,9-HxCDF	pg/g	0.14	U	UJ	0.121	U	UJ
2,3,4,6,7,8-HxCDF	pg/g	0.119	U	UJ	0.0978	U	UJ
1,2,3,4,6,7,8-HpCDF	pg/g	0.457	J	J	0.15	U	UJ
1,2,3,4,7,8,9-HpCDF	pg/g	0.191	U	UJ	0.162	U	UJ
OCDF	pg/g	1.27	J	J	0.533	J	J
Total TCDF	pg/g	0.632		J	0.109	U	UJ
Total PeCDF	pg/g	0.372		J	0.349	U	UJ
Total HxCDF	pg/g	0.207	U	UJ	0.133	U	UJ
Total HpCDF	pg/g	0.457		J	0.2	U	UJ
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.401			0.336		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLPC-13

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 20-Nov-2012 14:00

Sample Data
Matrix: Soil
Sample Size: 9.99 g
% Solids: 99.1

Laboratory Data
Lab Sample: 2110001-01 Date Received: 26-Nov-2012 8:58
QC Batch: B2K0003 Date Extracted: 28-Nov-2012 13:59
Date Analyzed : 01-Dec-12 08:53 Column: Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND		0.102	J
1,2,3,7,8-PeCDD	ND	0.346		
1,2,3,4,7,8-HxCDD	ND	0.238		
1,2,3,6,7,8-HxCDD	ND	0.282		
1,2,3,7,8,9-HxCDD	ND	0.285		
1,2,3,4,6,7,8-HpCDD	ND	0.819		
OCDD	7.23			
2,3,7,8-TCDF	ND	0.236		
1,2,3,7,8-PeCDF	ND	0.188		
2,3,4,7,8-PeCDF	ND		0.104	
1,2,3,4,7,8-HxCDF	ND	0.100		
1,2,3,6,7,8-HxCDF	ND	0.187		
2,3,4,6,7,8-HxCDF	ND	0.119		
1,2,3,7,8,9-HxCDF	ND	0.140		
1,2,3,4,6,7,8-HpCDF	0.457			J
1,2,3,4,7,8,9-HpCDF	ND	0.191		J
OCDF	1.27			J

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	107	25 - 164	
	13C-1,2,3,7,8-PeCDD	102	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	84.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	85.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	82.8	23 - 140	
	13C-OCDD	110	17 - 157	
	13C-2,3,7,8-TCDF	102	24 - 169	
	13C-1,2,3,7,8-PeCDF	118	24 - 185	
	13C-2,3,4,7,8-PeCDF	120	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	85.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	83.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82.6	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	84.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	78.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	91.0	26 - 138	
	13C-OCDF	85.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	88.4	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.00712

TOTALS

Total TCDD	0.264		0.365	J
Total PeCDD	ND	0.346		
Total HxCDD	ND	0.406		
Total HpCDD	ND	0.819		
Total TCDF	0.632			
Total PeCDF	0.372		0.734	
Total HxCDF	ND	0.207		
Total HpCDF	0.457			

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Approved By: William Luksemburg 04-Dec-2012 18:02

Sample ID: PRR1SOLPC-14

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 20-Nov-2012 14:30

Sample Data
Matrix: Soil
Sample Size: 10.3 g
% Solids: 97.3

Laboratory Data
Lab Sample: 2110001-02 Date Received: 26-Nov-2012 8:58
QC Batch: B2K0003 Date Extracted: 28-Nov-2012 13:59
Date Analyzed : 01-Dec-12 09:41 Column: Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.188		J
1,2,3,7,8-PeCDD	ND	0.278		
1,2,3,4,7,8-HxCDD	ND	0.272		
1,2,3,6,7,8-HxCDD	ND	0.294		
1,2,3,7,8,9-HxCDD	ND	0.301		
1,2,3,4,6,7,8-HpCDD	ND	0.525		
OCDD	2.20			J
2,3,7,8-TCDF	ND	0.109		J
1,2,3,7,8-PeCDF	ND	0.180		
2,3,4,7,8-PeCDF	ND	0.182		
1,2,3,4,7,8-HxCDF	ND	0.0754		
1,2,3,6,7,8-HxCDF	ND	0.0813		
2,3,4,6,7,8-HxCDF	ND	0.0978		
1,2,3,7,8,9-HxCDF	ND	0.121		
1,2,3,4,6,7,8-HpCDF	ND	0.150		
1,2,3,4,7,8,9-HpCDF	ND	0.162		
OCDF	0.533			J
TOTALS				
Total TCDD	0.130		0.342	J
Total PeCDD	ND	0.278		
Total HxCDD	ND	0.476		
Total HpCDD	ND	0.525		
Total TCDF	ND	0.109		
Total PeCDF	ND	0.349		
Total HxCDF	ND	0.133		
Total HpCDF	ND	0.200		

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	98.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	99.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	88.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	84.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	84.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.2	23 - 140	
	13C-OCDD	86.1	17 - 157	
	13C-2,3,7,8-TCDF	95.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	119	24 - 185	
	13C-2,3,4,7,8-PeCDF	115	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	88.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	84.5	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	83.6	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	86.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	80.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	90.7	26 - 138	
	13C-OCDF	80.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	88.3	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.000820

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Approved By: William Luksemburg 04-Dec-2012 18:02

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

2110001 12.7°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1355	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLPC-13		14:00	soil	Grab	2	X																	
PRR1SOLPC-14		14:30	soil	Grab	2	X																	

Requested Analyses	
1	Dioxins (PCDD/PCDFs)
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

1 extra 4 oz jar submitted in case of sample breakage.

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 14 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	11/20/12	1700		Fed Ex	11/26/12 0905	[signature]
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan QAPP

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analysis

SDG# PRR1356 (2110013)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #18046R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1356 (2110013) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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				
					VOA	PEST	PCBs	PCDD/ PCDF	MISC
PRR1SOLPC-04	2110013-001	Soil	11/29/2012					X	
PRR1SOLPC-07	2110013-002	Soil	11/29/2012					X	

1. PCDD/PCDF – Dioxins/Furans by USEPA 1613

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the sample in this sample delivery group were completed within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in any associated method blank at or above the project quantitation limits (PQL) during PCDD/PCDF analysis.

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded percent recoveries within the acceptance range specified in the

analytical procedure.

5. SECOND COLUMN CONFIRMATION

The compound 2,3,7,8-TCDF was not detected in either sample. Therefore, confirmation analysis was not performed.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The matrix spike and matrix spike duplicate are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

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

7. Reporting

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (Vista Analytical) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

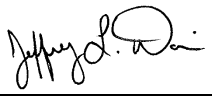
The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Jeffrey L. Davin
Project Scientist

SIGNATURE: 

DATE: December 13, 2102

PEER REVIEW BY: Joseph C. Houser

DATE: December 14, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1356 - Dioxins/Furans

ANALYTE	Units	PRR1SOLPC-04	LQ	VQ	PRR1SOLPC-07	LQ	VQ
2,3,7,8-TCDD	pg/g	0.181	U	U	0.157	U	U
1,2,3,7,8-PeCDD	pg/g	0.243	U	U	0.33	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.144	U	U	0.204	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.156	U	U	0.228	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.153	U	U	0.217	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.527	U	U	0.183	J	J
OCDD	pg/g	1.73	J	J	0.828	J	J
Total TCDD	pg/g	0.178			0.157	U	U
Total PeCDD	pg/g	0.243	U	U	0.33	U	U
Total HxCDD	pg/g	0.208	U	U	0.319	U	U
Total HpCDD	pg/g	0.527	U	U	0.183		
2,3,7,8-TCDF	pg/g	0.206	U	U	0.112	U	U
1,2,3,7,8-PeCDF	pg/g	0.174	U	U	0.222	U	U
2,3,4,7,8-PeCDF	pg/g	0.193	U	U	0.22	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.104	U	U	0.0778	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.104	U	U	0.0865	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.129	U	U	0.108	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.113	U	U	0.0962	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.176	EMPC	EMPC	0.161	U	U
1,2,3,4,7,8,9-HpCDF	pg/g	0.129	U	U	0.0751	U	U
OCDF	pg/g	0.557	EMPC	EMPC	0.267	U	U
Total TCDF	pg/g	0.206	U	U	0.112	U	U
Total PeCDF	pg/g	0.339	U	U	0.221	U	U
Total HxCDF	pg/g	0.169	U	U	0.155	U	U
Total HpCDF	pg/g	0.176	EMPC	EMPC	0.165	U	U
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.305			0.34		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLPC-04

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 29-Nov-2012 12:25

Sample Data
Matrix: Soil
Sample Size: 10.4 g
% Solids: 97.0

Laboratory Data
Lab Sample: 2110013-01 Date Received: 30-Nov-2012 8:40
QC Batch: B2L0007 Date Extracted: 04-Dec-2012 13:54
Date Analyzed : 06-Dec-12 02:07 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.181		
1,2,3,7,8-PeCDD	ND	0.243		
1,2,3,4,7,8-HxCDD	ND	0.144		
1,2,3,6,7,8-HxCDD	ND	0.156		
1,2,3,7,8,9-HxCDD	ND	0.153		
1,2,3,4,6,7,8-HpCDD	ND	0.527		
OCDD	1.73			J
2,3,7,8-TCDF	ND	0.206		
1,2,3,7,8-PeCDF	ND	0.174		
2,3,4,7,8-PeCDF	ND	0.193		
1,2,3,4,7,8-HxCDF	ND	0.104		
1,2,3,6,7,8-HxCDF	ND	0.104		
2,3,4,6,7,8-HxCDF	ND	0.113		
1,2,3,7,8,9-HxCDF	ND	0.129		
1,2,3,4,6,7,8-HpCDF	ND		0.176	
1,2,3,4,7,8,9-HpCDF	ND	0.129		
OCDF	ND		0.557	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	92.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	85.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	91.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	91.3	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	89.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	83.2	23 - 140	
	13C-OCDD	78.6	17 - 157	
	13C-2,3,7,8-TCDF	88.8	24 - 169	
	13C-1,2,3,7,8-PeCDF	104	24 - 185	
	13C-2,3,4,7,8-PeCDF	103	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	83.0	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	78.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	84.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	94.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	88.5	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	88.3	26 - 138	
	13C-OCDF	83.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	79.3	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.000519

TOTALS

Total TCDD	0.178			
Total PeCDD	ND	0.243		
Total HxCDD	ND	0.208		
Total HpCDD	ND	0.527		
Total TCDF	ND	0.206		
Total PeCDF	ND	0.339		
Total HxCDF	ND	0.169		
Total HpCDF	ND		0.176	

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-07

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 29-Nov-2012 11:35

Sample Data
Matrix: Soil
Sample Size: 10.4 g
% Solids: 96.9

Laboratory Data
Lab Sample: 2110013-02 Date Received: 30-Nov-2012 8:40
QC Batch: B2L0007 Date Extracted: 04-Dec-2012 13:54
Date Analyzed : 05-Dec-12 23:43 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.157		
1,2,3,7,8-PeCDD	ND	0.330		
1,2,3,4,7,8-HxCDD	ND	0.204		
1,2,3,6,7,8-HxCDD	ND	0.228		
1,2,3,7,8,9-HxCDD	ND	0.217		
1,2,3,4,6,7,8-HpCDD	0.183			J
OCDD	0.828			J
2,3,7,8-TCDF	ND	0.112		
1,2,3,7,8-PeCDF	ND	0.222		
2,3,4,7,8-PeCDF	ND	0.220		
1,2,3,4,7,8-HxCDF	ND	0.0778		
1,2,3,6,7,8-HxCDF	ND	0.0865		
2,3,4,6,7,8-HxCDF	ND	0.0962		
1,2,3,7,8,9-HxCDF	ND	0.108		
1,2,3,4,6,7,8-HpCDF	ND	0.161		
1,2,3,4,7,8,9-HpCDF	ND	0.0751		
OCDF	ND	0.267		

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	89.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	79.4	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	84.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.1	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	86.1	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	97.0	23 - 140	
	13C-OCDD	111	17 - 157	
	13C-2,3,7,8-TCDF	86.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	84.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.9	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	82.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	78.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	80.9	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	85.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	87.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	116	26 - 138	
	13C-OCDF	110	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	84.4	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.00208

TOTALS

Total TCDD	ND	0.157		
Total PeCDD	ND	0.330		
Total HxCDD	ND	0.319		
Total HpCDD	0.183		0.332	
Total TCDF	ND	0.112		
Total PeCDF	ND	0.221		
Total HxCDF	ND	0.155		
Total HpCDF	ND	0.165		

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

2110013

1.9°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1356	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLPC-04	11/29/2012	12:25	soil	Grab	2	X																	
PRR1SOLPC-07	11/29/2012	11:35	soil	Grab	3	X																	MS/MSD collected

Requested Analyses	
1	Dioxins (PCDD/PCDFs)
2	
3	
4	
7	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Special Instructions/Comments:

1 extra 4 oz jar submitted in case of sample breakage.

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	11/29/12	1630	Bethany L Burdick	11/30/12 0744		
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans Analyses

SDG #: PRR1357 (2120040)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #: 18186R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1357 (2120040) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1SOLPC-08	2120040-01	Soil	12/10/2012					X	
PRR1SOLPC-01	2120040-02	Soil	12/11/2012					X	
PRR1SOLPC-02	2120040-03	Soil	12/12/2012					X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results were qualified as not detected due to detections of the compounds in the associated blanks. See Section 2, Blank Contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQLs) during PCDD/PCDF analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Location	Analyte	Sample Result	Qualification
PRR1SOLPC-08 PRR1SOLPC-01 PRR1SOLPC-02	Total HpCDD	Detected sample results < PQL and < BAL	"UB" at the PQL

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

6. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was not detected in any of the sample locations within this SDG. Therefore, confirmation analysis was not required.

7. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

11. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: January 7, 2013

PEER REVIEW: Joseph C. Houser

DATE: January 7, 2013

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1357 - Dioxins/Furans

ANALYTE	Units	PRR1SOLPC-01	LQ	VQ	PRR1SOLPC-02	LQ	VQ	PRR1SOLPC-08	LQ	VQ
2,3,7,8-TCDD	pg/g	0.103	U	U	0.21	U	U	0.435	J	J
1,2,3,7,8-PeCDD	pg/g	0.0623	U	U	0.0576	U	U	0.179	J	J
1,2,3,4,7,8-HxCDD	pg/g	0.0999	U	U	0.155	U	U	0.19	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.111	U	U	0.181	U	U	0.235	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.104	U	U	0.172	U	U	0.243	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.125	J	J	0.089525	EMPC	EMPC	0.104539	EMPC	EMPC
OCDD	pg/g	0.632	J	J	0.718	J	J	0.914	J	J
Total TCDD	pg/g	0.103	U	U	0.21	U	U	253		
Total PeCDD	pg/g	0.139	U	U	0.0576	U	U	26.9		
Total HxCDD	pg/g	0.158	U	U	0.328	U	U	0.359		
Total HpCDD	pg/g	2.5	B	UB	2.5	B	UB	2.5	B	UB
2,3,7,8-TCDF	pg/g	0.0496	U	U	0.0408	U	U	0.0413	U	U
1,2,3,7,8-PeCDF	pg/g	0.0605	U	U	0.0562	U	U	0.0773	U	U
2,3,4,7,8-PeCDF	pg/g	0.0598	U	U	0.0515	U	U	0.082	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.0365	U	U	0.0448	U	U	0.0529	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.0369	U	U	0.0498	U	U	0.057	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.0534	U	U	0.063	U	U	0.0841	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.0434	U	U	0.0499	U	U	0.0697	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.0686	J	J	0.0477	U	U	0.0852	U	U
1,2,3,4,7,8,9-HpCDF	pg/g	0.0468	U	U	0.0408	U	U	0.0714	U	U
OCDF	pg/g	0.084	J	J	0.228	U	U	0.226	U	U
Total TCDF	pg/g	0.0496	U	U	0.0408	U	U	21.3		
Total PeCDF	pg/g	0.0792	U	U	0.096	U	U	2.93		
Total HxCDF	pg/g	0.0661	U	U	0.0852	U	U	0.0947		
Total HpCDF	pg/g	0.0686			0.0562	U	U	0.138	U	U
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.122			0.182			0.678		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLPC-08 **EPA Method 1613B**

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 10-Dec-2012 12:45

Sample Data
Matrix: Soil
Sample Size: 10.2 g
% Solids: 97.3

Laboratory Data
Lab Sample: 2120040-01 Date Received: 14-Dec-2012 7:39
QC Batch: B2L0045 Date Extracted: 14-Dec-2012 10:25
Date Analyzed : 17-Dec-12 22:32 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	0.435			J
1,2,3,7,8-PeCDD	0.179			J
1,2,3,4,7,8-HxCDD	ND	0.190		
1,2,3,6,7,8-HxCDD	ND	0.235		
1,2,3,7,8,9-HxCDD	ND	0.243		
1,2,3,4,6,7,8-HpCDD	ND		0.105	
OCDD	0.914			J
2,3,7,8-TCDF	ND	0.0413		
1,2,3,7,8-PeCDF	ND	0.0773		
2,3,4,7,8-PeCDF	ND	0.0820		
1,2,3,4,7,8-HxCDF	ND	0.0529		
1,2,3,6,7,8-HxCDF	ND	0.0570		
2,3,4,6,7,8-HxCDF	ND	0.0697		
1,2,3,7,8,9-HxCDF	ND	0.0841		
1,2,3,4,6,7,8-HpCDF	ND	0.0852		
1,2,3,4,7,8,9-HpCDF	ND	0.0714		
OCDF	ND	0.226		

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	86.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.5	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	66.5	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	61.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	61.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	76.8	23 - 140	
	13C-OCDD	85.0	17 - 157	
	13C-2,3,7,8-TCDF	81.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	77.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	78.7	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	81.7	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	80.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	83.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	77.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	86.8	26 - 138	
	13C-OCDF	92.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	88.5	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.614

TOTALS

Total TCDD	253		253	
Total PeCDD	26.9			
Total HxCDD	0.359		0.778	
Total HpCDD	~~0.174~~ 2.5		~~0.278~~	UB ~~D~~
Total TCDF	21.3		21.3	
Total PeCDF	2.93			
Total HxCDF	0.0947		0.219	
Total HpCDF	ND	0.138		

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-01

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 11-Dec-2012 14:30

Sample Data
Matrix: Soil
Sample Size: 10.3 g
% Solids: 97.1

Laboratory Data
Lab Sample: 2120040-02 Date Received: 14-Dec-2012 7:39
QC Batch: B2L0045 Date Extracted: 14-Dec-2012 10:25
Date Analyzed : 17-Dec-12 23:20 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.103		
1,2,3,7,8-PeCDD	ND	0.0623		
1,2,3,4,7,8-HxCDD	ND	0.0999		
1,2,3,6,7,8-HxCDD	ND	0.111		
1,2,3,7,8,9-HxCDD	ND	0.104		
1,2,3,4,6,7,8-HpCDD	0.125			J
OCDD	0.632			J
2,3,7,8-TCDF	ND	0.0496		
1,2,3,7,8-PeCDF	ND	0.0605		
2,3,4,7,8-PeCDF	ND	0.0598		
1,2,3,4,7,8-HxCDF	ND	0.0365		
1,2,3,6,7,8-HxCDF	ND	0.0369		
2,3,4,6,7,8-HxCDF	ND	0.0434		
1,2,3,7,8,9-HxCDF	ND	0.0534		
1,2,3,4,6,7,8-HpCDF	0.0686			J
1,2,3,4,7,8,9-HpCDF	ND	0.0468		
OCDF	0.0840			J

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	76.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	83.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	57.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	53.4	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	58.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	78.9	23 - 140	
	13C-OCDD	72.2	17 - 157	
	13C-2,3,7,8-TCDF	73.4	24 - 169	
	13C-1,2,3,7,8-PeCDF	70.9	24 - 185	
	13C-2,3,4,7,8-PeCDF	66.0	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	79.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	73.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	75.0	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	75.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	75.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	81.9	26 - 138	
	13C-OCDF	81.3	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	90.8	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.00215

TOTALS

Total TCDD	ND	0.103	
Total PeCDD	ND	0.139	
Total HxCDD	ND	0.158	
Total HpCDD	~~0.254~~ 2.5		UB ~~B~~
Total TCDF	ND	0.0496	
Total PeCDF	ND	0.0792	
Total HxCDF	ND	0.0661	
Total HpCDF	0.0686		

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-02 **EPA Method 1613B**

Client Data
Name: ARCADIS U.S., Inc.
Project:
Date Collected: 12-Dec-2012 15:15

Sample Data
Matrix: Soil
Sample Size: 10.0 g
% Solids: 99.2

Laboratory Data
Lab Sample: 2120040-03 Date Received: 14-Dec-2012 7:39
QC Batch: B2L0045 Date Extracted: 14-Dec-2012 10:25
Date Analyzed : 18-Dec-12 00:08 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.210		
1,2,3,7,8-PeCDD	ND	0.0576		
1,2,3,4,7,8-HxCDD	ND	0.155		
1,2,3,6,7,8-HxCDD	ND	0.181		
1,2,3,7,8,9-HxCDD	ND	0.172		
1,2,3,4,6,7,8-HpCDD	ND		0.0895	
OCDD	0.718			J
2,3,7,8-TCDF	ND	0.0408		
1,2,3,7,8-PeCDF	ND	0.0562		
2,3,4,7,8-PeCDF	ND	0.0515		
1,2,3,4,7,8-HxCDF	ND	0.0448		
1,2,3,6,7,8-HxCDF	ND	0.0498		
2,3,4,6,7,8-HxCDF	ND	0.0499		
1,2,3,7,8,9-HxCDF	ND	0.0630		
1,2,3,4,6,7,8-HpCDF	ND	0.0477		
1,2,3,4,7,8,9-HpCDF	ND	0.0408		
OCDF	ND	0.228		

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	90.7	25 - 164	
	13C-1,2,3,7,8-PeCDD	97.3	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	63.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	54.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	55.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	76.5	23 - 140	
	13C-OCDD	76.6	17 - 157	
	13C-2,3,7,8-TCDF	92.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	62.3	24 - 185	
	13C-2,3,4,7,8-PeCDF	73.0	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	84.5	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	86.3	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	87.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	78.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	80.7	26 - 138	
	13C-OCDF	85.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	99.2	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.000215

TOTALS

Total TCDD	ND	0.210		
Total PeCDD	ND	0.0576		
Total HxCDD	ND	0.328		
Total HpCDD	~~0.118~~ 2.5		~~0.208~~	UB ~~B~~
Total TCDF	ND	0.0408		
Total PeCDF	ND	0.0960		
Total HxCDF	ND	0.0852		
Total HpCDF	ND	0.0562		

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

ARCADIS

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

2120040 0°C

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1357	

SAMPLERS:

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLPC-08	12/10/2012	12:45	soil	Grab	2	X																	
PRR1SOLPC-01	12/11/2012	14:30	soil	Grab	2	X																	
PRR1SOLPC-02	12/12/2012	15:15	soil	Grab	2	X																	

Requested Analyses

1 Dioxins (PCDD/PCDFs)

Special Instructions/Comments:

1 extra 4 oz jar submitted in case of sample breakage.

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
MK	12/13/12	1900	Bethany J Bredict	12/14/12 0742		
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Dioxins/Furans and PCBs as Congeners Analyses

SDG #: PRR1358 (2120056)

Analyses Performed By:
Vista Analytical Laboratory
El Dorado Hills, California

Report: #: 18187R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1358 (2120056) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with USEPA Region II Data Validation SOP HW-55, Environmental Data Services SOPs and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	PEST	PCB	PCDD/ PCDF	MISC
PRR1SOLPC-11	2120056-01	Soil	12/14/2012					X	
PRR1SOLPC-10	2120056-02	Soil	12/14/2012					X	
PRR1SOLPC-05	2120056-03	Soil	12/14/2012					X	
PRR1SOLPC-06	2120056-04	Soil	12/14/2012					X	
PRR1SOLPC-09	2120056-05	Soil	12/18/2012					X	
PRR1SOLPC-03	2120056-06	Soil	12/18/2012					X	

Notes:

1. PCDD/PCDF – Dioxins/Furans by USEPA Method 1613

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

DIOXIN/FURAN DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

Several sample results were qualified as not detected due to detections of the compounds in the associated blanks. See Section 2, Blank Contamination.

1. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The extractions and analyses performed on the samples in this sample delivery group were done within the technical holding times.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination during field operations. A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (ten times for OCDD and OCDF) is calculated for QA blanks containing concentrations greater than the estimated detection limit (EDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in the associated method blank at or above the project quantitation limits (PQLs) during PCDD/PCDF analysis. However, target compounds were detected in the blanks at concentrations less than the PQLs. Sample results less than the BAL associated with the following sample locations were qualified as 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).

Sample Location	Analyte	Sample Result	Qualification
PRR1SOLPC-10 PRR1SOLPC-05 PRR1SOLPC-09 PRR1SOLPC-03	OCDD OCDF	Detected sample results < PQL and < BAL	“UB” at the PQL

Sample Location	Analyte	Sample Result	Qualification
PRR1SOLPC-11	OCDF	Detected sample results < PQL and < BAL	"UB" at the PQL
PRR1SOLPC-11 PRR1SOLPC-06	OCDD	Detected sample results > PQL and < BAL	"UB" at the detected sample concentration

EDL Estimated sample detection limit

3. LABELED COMPOUND STANDARD PERFORMANCE

All samples to be analyzed for PCDD/PCDF compounds are spiked with labeled compound spiking standard (surrogate) prior to extraction. The concentration of the compounds is determined by using the labeled spiking standard.

All labeled compound recoveries were acceptable.

4. ONGOING PRECISION AND RECOVERY

Ongoing precision and recovery (OPR) standards were processed at the method-specified frequency. Upon examination, all analytes yielded recoveries within the acceptance range specified in the analytical procedure.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

6. SECOND COLUMN CONFIRMATION

2,3,7,8-TCDF was detected in sample locations PRR1SOLPC-06 and PRR1SOLPC-09. The confirmation analysis was not reported; however, the concentrations of 2,3,7,8-TCDF were less than the PQL.

7. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 100% for air matrices is applied to the relative percent difference (RPD) between the parent sample and field duplicate results.

A field duplicate sample analysis was not performed on a sample location within this SDG.

8. REPORTING

This SDG does not contain any dilutions or re-analyses. The laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

9. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

10. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	This compound was also detected in the method blank.
EMPC	Estimated Maximum Possible Concentration.
J	The amount detected is below the Low Calibration Limit.
I	Chemical Interference.
U/ND	Not Detected.

11. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: January 7, 2013

PEER REVIEW: Joseph C. Houser

DATE: January 8, 2013

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1358 - Dioxins/Furans

ANALYTE	Units	PRR1SOLPC-03	LQ	VQ	PRR1SOLPC-05	LQ	VQ	PRR1SOLPC-06	LQ	VQ
2,3,7,8-TCDD	pg/g	0.0895	U	U	0.0743	U	U	0.765		
1,2,3,7,8-PeCDD	pg/g	0.147	U	U	0.119	U	U	0.151	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.176	U	U	0.158	U	U	0.163	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.191	U	U	0.175	U	U	0.182	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.222	U	U	0.185	U	U	0.196	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.377	U	U	0.366	U	U	0.853	J	J
OCDD	pg/g	5	JB	UB	5	JB	UB	6.16	B	UB
Total TCDD	pg/g	1.75			0.0743	U	U	2.36		
Total PeCDD	pg/g	0.147	U	U	0.119	U	U	0.338		
Total HxCDD	pg/g	0.222	U	U	0.185	U	U	0.196	U	U
Total HpCDD	pg/g	0.373			0.366	U	U	1.6		
2,3,7,8-TCDF	pg/g	0.0892	U	U	0.0867	U	U	0.25	J	J
1,2,3,7,8-PeCDF	pg/g	0.0786	U	U	0.0896	U	U	0.126	J	J
2,3,4,7,8-PeCDF	pg/g	0.0759	U	U	0.0877	U	U	0.957	J	J
1,2,3,4,7,8-HxCDF	pg/g	0.132	U	U	0.136	U	U	1.07	J	J
1,2,3,6,7,8-HxCDF	pg/g	0.123	U	U	0.129	U	U	0.326	J	J
1,2,3,7,8,9-HxCDF	pg/g	0.217	U	U	0.206	U	U	0.208	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.153	U	U	0.147	U	U	0.155	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.454	EMPC	EMPC	0.61	J	J	1.57	J	J
1,2,3,4,7,8,9-HpCDF	pg/g	0.443	U	U	0.427	U	U	0.407	U	U
OCDF	pg/g	5	JB	UB	5	JB	UB	4.67	JB	J
Total TCDF	pg/g	0.0892	U	U	0.0867	U	U	11.5		
Total PeCDF	pg/g	0.0786	U	U	0.0896	U	U	8.66		
Total HxCDF	pg/g	0.217	U	U	0.206	U	U	2.72		
Total HpCDF	pg/g	0.454	EMPC	EMPC	0.61			1.94		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.206			0.184			1.37		

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Vista Analytical
PRR-1358 - Dioxins/Furans

ANALYTE	Units	PRR1SOLPC-09	LQ	VQ	PRR1SOLPC-10	LQ	VQ	PRR1SOLPC-11	LQ	VQ
2,3,7,8-TCDD	pg/g	0.132	J	J	0.0767	U	U	0.112	U	U
1,2,3,7,8-PeCDD	pg/g	0.116	U	U	0.108	U	U	0.138	U	U
1,2,3,4,7,8-HxCDD	pg/g	0.189	U	U	0.134	U	U	0.15	U	U
1,2,3,6,7,8-HxCDD	pg/g	0.206	U	U	0.154	U	U	0.175	U	U
1,2,3,7,8,9-HxCDD	pg/g	0.231	U	U	0.173	U	U	0.187	U	U
1,2,3,4,6,7,8-HpCDD	pg/g	0.728	J	J	0.307	U	U	0.778	J	J
OCDD	pg/g	5	JB	UB	5	JB	UB	5.26	B	UB
Total TCDD	pg/g	11.2			0.0767	U	U	0.112	U	U
Total PeCDD	pg/g	1.16			0.108	U	U	0.138	U	U
Total HxCDD	pg/g	0.399			0.173	U	U	0.187	U	U
Total HpCDD	pg/g	1.37			0.375			1.55		
2,3,7,8-TCDF	pg/g	0.204	J	J	0.0795	U	U	0.133	U	U
1,2,3,7,8-PeCDF	pg/g	0.116	U	U	0.0841	U	U	0.105	U	U
2,3,4,7,8-PeCDF	pg/g	1.18	J	J	0.0825	U	U	0.0941	U	U
1,2,3,4,7,8-HxCDF	pg/g	0.917	J	J	0.131	U	U	0.146	U	U
1,2,3,6,7,8-HxCDF	pg/g	0.345	J	J	0.13	U	U	0.147	U	U
1,2,3,7,8,9-HxCDF	pg/g	0.18	U	U	0.214	U	U	0.246	U	U
2,3,4,6,7,8-HxCDF	pg/g	0.134	U	U	0.153	U	U	0.167	U	U
1,2,3,4,6,7,8-HpCDF	pg/g	0.629	J	J	0.574	J	J	0.864	J	J
1,2,3,4,7,8,9-HpCDF	pg/g	0.356	U	U	0.395	U	U	0.445	U	U
OCDF	pg/g	5	JB	UB	5	JB	UB	5	JB	UB
Total TCDF	pg/g	14.7			0.0795	U	U	0.133	U	U
Total PeCDF	pg/g	10.7			0.0841	U	U	0.105	U	U
Total HxCDF	pg/g	2.61			0.214	U	U	0.246	U	U
Total HpCDF	pg/g	1.01			1.02			0.864		
WHO Dioxin TEQ(Human/Mammal-NDs used at 1/2 DL)	pg/g	0.756			0.175			0.228		

SAMPLE ANALYSIS DATA SHEETS AND COCs

Sample ID: PRR1SOLPC-11 **EPA Method 1613B**

Client Data
Name: ARCADIS U.S., Inc.
Project: Tierra Phase I Removal
Date Collected: 14-Dec-2012 11:30

Sample Data
Matrix: Soil
Sample Size: 10.3 g
% Solids: 98.2

Laboratory Data
Lab Sample: 2120056-01 Date Received: 20-Dec-2012 10:08
QC Batch: B2L0084 Date Extracted: 20-Dec-2012 15:52
Date Analyzed : 22-Dec-12 23:25 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.112		
1,2,3,7,8-PeCDD	ND	0.138		
1,2,3,4,7,8-HxCDD	ND	0.150		
1,2,3,6,7,8-HxCDD	ND	0.175		
1,2,3,7,8,9-HxCDD	ND	0.187		
1,2,3,4,6,7,8-HpCDD	0.778			J
OCDD	5.26			U B
2,3,7,8-TCDF	ND	0.133		
1,2,3,7,8-PeCDF	ND	0.105		
2,3,4,7,8-PeCDF	ND	0.0941		
1,2,3,4,7,8-HxCDF	ND	0.146		
1,2,3,6,7,8-HxCDF	ND	0.147		
2,3,4,6,7,8-HxCDF	ND	0.167		
1,2,3,7,8,9-HxCDF	ND	0.246		
1,2,3,4,6,7,8-HpCDF	0.864			J
1,2,3,4,7,8,9-HpCDF	ND	0.445		
OCDF	~~1.84~~ 5.0			UB ~~J, B~~

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	71.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.6	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	68.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	78.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	73.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	65.9	23 - 140	
	13C-OCDD	52.0	17 - 157	
	13C-2,3,7,8-TCDF	68.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	78.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	94.9	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	75.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	76.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	79.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	73.5	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	73.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	60.4	26 - 138	
	13C-OCDF	56.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	70.1	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.0186

TOTALS

Total TCDD	ND	0.112
Total PeCDD	ND	0.138
Total HxCDD	ND	0.187
Total HpCDD	1.55	
Total TCDF	ND	0.133
Total PeCDF	ND	0.105
Total HxCDF	ND	0.246
Total HpCDF	0.864	

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-10 **EPA Method 1613B**

Client Data
Name: ARCADIS U.S., Inc.
Project: Tierra Phase I Removal
Date Collected: 14-Dec-2012 12:10

Sample Data
Matrix: Soil
Sample Size: 10.1 g
% Solids: 98.9

Laboratory Data
Lab Sample: 2120056-02 Date Received: 20-Dec-2012 10:08
QC Batch: B2L0084 Date Extracted: 20-Dec-2012 15:52
Date Analyzed : 23-Dec-12 00:15 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.0767		
1,2,3,7,8-PeCDD	ND	0.108		
1,2,3,4,7,8-HxCDD	ND	0.134		
1,2,3,6,7,8-HxCDD	ND	0.154		
1,2,3,7,8,9-HxCDD	ND	0.173		
1,2,3,4,6,7,8-HpCDD	ND	0.307		
OCDD	~~3.07~~ 5.0			UB ~~J,B~~
2,3,7,8-TCDF	ND	0.0795		
1,2,3,7,8-PeCDF	ND	0.0841		
2,3,4,7,8-PeCDF	ND	0.0825		
1,2,3,4,7,8-HxCDF	ND	0.131		
1,2,3,6,7,8-HxCDF	ND	0.130		
2,3,4,6,7,8-HxCDF	ND	0.153		
1,2,3,7,8,9-HxCDF	ND	0.214		
1,2,3,4,6,7,8-HpCDF	0.574			J
1,2,3,4,7,8,9-HpCDF	ND	0.395		
OCDF	~~1.26~~ 5.0			UB ~~J,B~~

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	88.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	72.4	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.5	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	71.2	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	66.1	23 - 140	
	13C-OCDD	50.6	17 - 157	
	13C-2,3,7,8-TCDF	90.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	80.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	94.5	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	78.4	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	80.4	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	81.2	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	71.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	58.5	26 - 138	
	13C-OCDF	56.6	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	82.6	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.00704

TOTALS

Total TCDD	ND	0.0767
Total PeCDD	ND	0.108
Total HxCDD	ND	0.173
Total HpCDD	0.375	
Total TCDF	ND	0.0795
Total PeCDF	ND	0.0841
Total HxCDF	ND	0.214
Total HpCDF	1.02	

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-05

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project: Tierra Phase I Removal
Date Collected: 14-Dec-2012 12:45

Sample Data
Matrix: Soil
Sample Size: 10.2 g
% Solids: 98.5

Laboratory Data
Lab Sample: 2120056-03 Date Received: 20-Dec-2012 10:08
QC Batch: B2L0084 Date Extracted: 20-Dec-2012 15:52
Date Analyzed : 23-Dec-12 01:05 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.0743		
1,2,3,7,8-PeCDD	ND	0.119		
1,2,3,4,7,8-HxCDD	ND	0.158		
1,2,3,6,7,8-HxCDD	ND	0.175		
1,2,3,7,8,9-HxCDD	ND	0.185		
1,2,3,4,6,7,8-HpCDD	ND	0.366		
OCDD	~~2.77~~ 5.0			UB ~~J,B~~
2,3,7,8-TCDF	ND	0.0867		
1,2,3,7,8-PeCDF	ND	0.0896		
2,3,4,7,8-PeCDF	ND	0.0877		
1,2,3,4,7,8-HxCDF	ND	0.136		
1,2,3,6,7,8-HxCDF	ND	0.129		
2,3,4,6,7,8-HxCDF	ND	0.147		
1,2,3,7,8,9-HxCDF	ND	0.206		
1,2,3,4,6,7,8-HpCDF	0.610			J
1,2,3,4,7,8,9-HpCDF	ND	0.427		
OCDF	~~0.965~~ 5.0			UB ~~J,B~~

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	72.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	82.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	62.3	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	71.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	64.8	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	59.2	23 - 140	
	13C-OCDD	46.6	17 - 157	
	13C-2,3,7,8-TCDF	78.9	24 - 169	
	13C-1,2,3,7,8-PeCDF	74.5	24 - 185	
	13C-2,3,4,7,8-PeCDF	89.6	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	69.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	74.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	71.4	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	67.3	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	63.8	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	53.6	26 - 138	
	13C-OCDF	52.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	69.4	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.00722

TOTALS

Total TCDD	ND	0.0743
Total PeCDD	ND	0.119
Total HxCDD	ND	0.185
Total HpCDD	ND	0.366
Total TCDF	ND	0.0867
Total PeCDF	ND	0.0896
Total HxCDF	ND	0.206
Total HpCDF	0.610	

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-06

EPA Method 1613B

Client Data
Name: ARCADIS U.S., Inc.
Project: Tierra Phase I Removal
Date Collected: 14-Dec-2012 16:30

Sample Data
Matrix: Soil
Sample Size: 10.5 g
% Solids: 96.8

Laboratory Data
Lab Sample: 2120056-04 Date Received: 20-Dec-2012 10:08
QC Batch: B2L0084 Date Extracted: 20-Dec-2012 15:52
Date Analyzed : 23-Dec-12 01:55 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	0.765			
1,2,3,7,8-PeCDD	ND	0.151		
1,2,3,4,7,8-HxCDD	ND	0.163		
1,2,3,6,7,8-HxCDD	ND	0.182		
1,2,3,7,8,9-HxCDD	ND	0.196		
1,2,3,4,6,7,8-HpCDD	0.853			J
OCDD	6.16			J B
2,3,7,8-TCDF	0.250			J
1,2,3,7,8-PeCDF	0.126			J
2,3,4,7,8-PeCDF	0.957			J
1,2,3,4,7,8-HxCDF	1.07			J
1,2,3,6,7,8-HxCDF	0.326			J
2,3,4,6,7,8-HxCDF	ND	0.155		
1,2,3,7,8,9-HxCDF	ND	0.208		
1,2,3,4,6,7,8-HpCDF	1.57			J
1,2,3,4,7,8,9-HpCDF	ND	0.407		
OCDF	4.67			J, ~~B~~

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	91.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	101	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	73.1	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	85.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	79.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	70.3	23 - 140	
	13C-OCDD	57.6	17 - 157	
	13C-2,3,7,8-TCDF	90.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	91.6	24 - 185	
	13C-2,3,4,7,8-PeCDF	108	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	82.5	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	87.3	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	84.5	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	80.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	77.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	66.7	26 - 138	
	13C-OCDF	62.2	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	95.5	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	1.25

TOTALS

Total TCDD	2.36		2.79
Total PeCDD	0.338		
Total HxCDD	ND	0.196	
Total HpCDD	1.60		
Total TCDF	11.5		14.7
Total PeCDF	8.66		9.30
Total HxCDF	2.72		
Total HpCDF	1.94		

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-09 **EPA Method 1613B**

Client Data
Name: ARCADIS U.S., Inc.
Project: Tierra Phase I Removal
Date Collected: 18-Dec-2012 14:45

Sample Data
Matrix: Soil
Sample Size: 10.4 g
% Solids: 95.8

Laboratory Data
Lab Sample: 2120056-05 Date Received: 20-Dec-2012 10:08
QC Batch: B2L0084 Date Extracted: 20-Dec-2012 15:52
Date Analyzed : 23-Dec-12 02:44 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	0.132			J
1,2,3,7,8-PeCDD	ND	0.116		
1,2,3,4,7,8-HxCDD	ND	0.189		
1,2,3,6,7,8-HxCDD	ND	0.206		
1,2,3,7,8,9-HxCDD	ND	0.231		
1,2,3,4,6,7,8-HpCDD	0.728			J
OCDD	~~4.51~~ 5.0			UB ~~J,B~~
2,3,7,8-TCDF	0.204			J
1,2,3,7,8-PeCDF	ND	0.116		
2,3,4,7,8-PeCDF	1.18			J
1,2,3,4,7,8-HxCDF	0.917			J
1,2,3,6,7,8-HxCDF	0.345			J
2,3,4,6,7,8-HxCDF	ND	0.134		
1,2,3,7,8,9-HxCDF	ND	0.180		
1,2,3,4,6,7,8-HpCDF	0.629			J
1,2,3,4,7,8,9-HpCDF	ND	0.356		
OCDF	~~1.17~~ 5.0			UB ~~J,B~~

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	82.0	25 - 164	
	13C-1,2,3,7,8-PeCDD	89.0	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	68.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	81.9	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	72.6	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	64.6	23 - 140	
	13C-OCDD	52.3	17 - 157	
	13C-2,3,7,8-TCDF	84.1	24 - 169	
	13C-1,2,3,7,8-PeCDF	80.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	94.3	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	75.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	80.5	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	80.8	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	74.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	71.0	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	57.5	26 - 138	
	13C-OCDF	54.7	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	79.7	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.648

TOTALS

Total TCDD	11.2	
Total PeCDD	1.16	1.46
Total HxCDD	0.399	0.670
Total HpCDD	1.37	
Total TCDF	14.7	15.7
Total PeCDF	10.7	
Total HxCDF	2.61	
Total HpCDF	1.01	

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

Sample ID: PRR1SOLPC-03 **EPA Method 1613B**

Client Data
Name: ARCADIS U.S., Inc.
Project: Tierra Phase I Removal
Date Collected: 18-Dec-2012 16:00

Sample Data
Matrix: Soil
Sample Size: 10.5 g
% Solids: 96.5

Laboratory Data
Lab Sample: 2120056-06 Date Received: 20-Dec-2012 10:08
QC Batch: B2L0084 Date Extracted: 20-Dec-2012 15:52
Date Analyzed : 23-Dec-12 03:34 Column: ZB-5 Analyst: MAS

Analyte	Conc. (pg/g)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.0895		
1,2,3,7,8-PeCDD	ND	0.147		
1,2,3,4,7,8-HxCDD	ND	0.176		
1,2,3,6,7,8-HxCDD	ND	0.191		
1,2,3,7,8,9-HxCDD	ND	0.222		
1,2,3,4,6,7,8-HpCDD	ND	0.377		
OCDD	~~2.24~~ 5.0			UB ~~J,B~~
2,3,7,8-TCDF	ND	0.0892		
1,2,3,7,8-PeCDF	ND	0.0786		
2,3,4,7,8-PeCDF	ND	0.0759		
1,2,3,4,7,8-HxCDF	ND	0.132		
1,2,3,6,7,8-HxCDF	ND	0.123		
2,3,4,6,7,8-HxCDF	ND	0.153		
1,2,3,7,8,9-HxCDF	ND	0.217		
1,2,3,4,6,7,8-HpCDF	ND		0.454	
1,2,3,4,7,8,9-HpCDF	ND	0.443		
OCDF	~~0.937~~ 5.0			UB ~~J,B~~

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	71.2	25 - 164	
	13C-1,2,3,7,8-PeCDD	77.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	59.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	71.0	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	65.0	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	58.6	23 - 140	
	13C-OCDD	45.9	17 - 157	
	13C-2,3,7,8-TCDF	71.6	24 - 169	
	13C-1,2,3,7,8-PeCDF	75.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	87.4	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	68.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	71.9	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	69.7	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	65.9	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	62.7	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	53.6	26 - 138	
	13C-OCDF	49.1	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	72.8	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	0.000953

TOTALS

Total TCDD	1.75		
Total PeCDD	ND	0.147	
Total HxCDD	ND	0.222	
Total HpCDD	0.373		
Total TCDF	ND	0.0892	
Total PeCDF	ND	0.0786	
Total HxCDF	ND	0.217	
Total HpCDF	ND		0.454

DL - Sample specifc estimated detection limit
EMPC - Estimated maximum possible concentration
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.

ARCADIS

ARCADIS
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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

2120056

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009964.0002.70004	Tierra Phase I Removal	PRR1358	

SAMPLERS: MAP, CSB

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1SOLPC-11	12/14/2012	11:30	soil	Grab	2	X																	
PRR1SOLPC-10	12/14/2012	12:10	soil	Grab	2	X																	
PRR1SOLPC-05	12/14/2012	12:45	soil	Grab	2	X																	
PRR1SOLPC-06	12/14/2012	16:30	soil	Grab	2	X																	
PRR1SOLPC-09	12/18/2012	14:45	soil	Grab	2	X																	
PRR1SOLPC-03	12/18/2012	16:00	soil	Grab	2	X																	

Requested Analyses	
1	Dioxins (PCDD/PCDFs)
2	
3	
4	
7	
5	
6	
7	
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11	
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16	
17	

Special Instructions/Comments:
1 extra 4 oz jar submitted in case of sample breakage.

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: Vista Analytical - El Dorado Hills, CA

Shipping Tracking #

Specify Turnaround Requirements: 7 day TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
[signature]	12-19-12	1300	Bottom J Benedict 1011 12/20/12			

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1313 (200-11015)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17546R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1313 (200-11015) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-27-SP-105	200-11015-1	Water	5/25/2012		X				
PRR1WATGACE-27-SP-106	200-11015-2	Water	5/25/2012		X				
PRR1WATGACE-27-SP-109	200-11015-3	Water	5/25/2012		X				
PRR1WATCME-56	200-11015-4	Water	5/25/2012						X
PRR1WAT-27-SP-101	200-11015-5	Water	5/25/2012						X
TB05252012	200-11015-6	Water	5/25/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-27-SP-105	Chlorobenzene	5100 E	4600 D	4600 D
PRR1WATGACE-27-SP-106	Chlorobenzene	6500 E	5700 D	5700 D
PRR1WATGACE-27-SP-109	Chlorobenzene	2600 E	2400 D	2400 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 13, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1313 - VOCs

ANALYTE	Units	PRR1WATGACE-27-SP-106	LQ	VQ	PRR1WATGACE-27-SP-109	LQ	VQ	PRR1WATGACI-27-SP-105	LQ	VQ
2-Butanone	ug/L	230 J		J	170			130 J		J
Chlorobenzene	ug/L	5700 D	B	D	2400 D	B	D	4600 D	B	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1313 - Miscellaneous

ANALYTE	Units	PRR1WAT-27-SP-101	LQ	VQ	PRR1WATCME-56	LQ	VQ
Total Suspended Solids	mg/L	33.6			4.9		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-27-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE11.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/29/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 60.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	230	J
108-90-7	Chlorobenzene	5700 ~~6500~~	E ~~B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-27-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/29/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 440.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	340	J D
108-90-7	Chlorobenzene	5700	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-27-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE14.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 24.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	170	
108-90-7	Chlorobenzene	2400 ~~2600~~	E B D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-27-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TAEVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 176.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	180	J D
108-90-7	Chlorobenzene	2400	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-27-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE08.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/29/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 47.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	130	J
108-90-7	Chlorobenzene	4600 ~~5100~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-27-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE07.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/29/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 338.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	150	J D
108-90-7	Chlorobenzene	4600	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05252012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1313

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11015-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE05.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/29/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.17	J B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-56 Lab Sample ID: 200-11015-4

Lab Name: TestAmerica Burlington Job No.: 200-11015-2

SDG ID.: PRR1313

Matrix: Water Date Sampled: 05/25/2012 09:05

Reporting Basis: WET Date Received: 05/29/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	4.9	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-27-SP-101 Lab Sample ID: 200-11015-5

Lab Name: TestAmerica Burlington Job No.: 200-11015-2

SDG ID.: PRR1313

Matrix: Water Date Sampled: 05/25/2012 09:25

Reporting Basis: WET Date Received: 05/29/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	33.6	2.1		mg/L			1	SM 2540D

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Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1313	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-27-SP-105	5/25/2012	9:20	water	Grab	3	X																	
PRR1WATGACE-27-SP-106	5/25/2012	9:16	water	Grab	3	X																	
PRR1WATGACE-27-SP-109	5/25/2012	9:11	water	Grab	3	X																	
PRR1WATCME-56	5/25/2012	9:05	water	Grab	1		X																
PRR1WAT-27-SP-101	5/25/2012	9:25	water	Grab	1		X																
TB05252012	5/25/2012		water	_	3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Lea Bruno	5/25/12	1330	Craig L. Burns			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig L. Burns	5/25/12	1430	5-29-12 0830			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1317 (200-11016)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17574R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1317 (200-11016) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-28-SP-105	200-11016-1	Water	5/26/2012		X				
PRR1WATGACE-28-SP-106	200-11016-2	Water	5/26/2012		X				
PRR1WATGACE-28-SP-109	200-11016-3	Water	5/26/2012		X				
PRR1WATCME-57	200-11016-4	Water	5/26/2012						X
PRR1WAT-28-SP-101	200-11016-5	Water	5/26/2012						X
TB05262012	200-11016-6	Water	5/26/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-28-SP-105	Chlorobenzene	4300 E	3900 D	3900 D
PRR1WATGACE-28-SP-106	Chlorobenzene	20000 E	15000 D	15000 D
PRR1WATGACE-28-SP-109	Chlorobenzene	7900 E	6900 D	6900 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 16, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1317 - VOCs

ANALYTE	Units	PRR1WATGACE-28-SP-106	LQ	VQ	PRR1WATGACE-28-SP-109	LQ	VQ	PRR1WATGACI-28-SP-105	LQ	VQ
2-Butanone	ug/L	1000			580			310		
Chlorobenzene	ug/L	15000 D	B	D	6900 D	B	D	3900 D	B	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1317 - Miscellaneous

ANALYTE	Units	PRR1WAT-28-SP-101	LQ	VQ	PRR1WATCME-57	LQ	VQ
Total Suspended Solids	mg/L	103			13.6		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-28-SP-106

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 152.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1000	
108-90-7	Chlorobenzene	15000 ~~20000~~	E ~~B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-28-SP-106D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE19.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1100.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	790	J D
108-90-7	Chlorobenzene	15000	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-28-SP-109

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE23.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 71.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	580	
108-90-7	Chlorobenzene	6900 ~~7900~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-28-SP-109D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 518.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	580	J D
108-90-7	Chlorobenzene	6900	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-28-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE17.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	310	
108-90-7	Chlorobenzene	3900 ~~4300~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-28-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/30/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 284.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	290	J D
108-90-7	Chlorobenzene	3900	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB05262012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1317

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11016-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIOE06.D

Level: (TRACE/LOW/MED) TRACE Date Received: 05/29/2012

% Moisture: not dec. Date Analyzed: 05/29/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.16	J B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-57 Lab Sample ID: 200-11016-4

Lab Name: TestAmerica Burlington Job No.: 200-11016-2

SDG ID.: PRR1317

Matrix: Water Date Sampled: 05/26/2012 07:15

Reporting Basis: WET Date Received: 05/29/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	13.6	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-28-SP-101 Lab Sample ID: 200-11016-5

Lab Name: TestAmerica Burlington Job No.: 200-11016-2

SDG ID.: PRR1317

Matrix: Water Date Sampled: 05/26/2012 07:20

Reporting Basis: WET Date Received: 05/29/2012 08:30

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	103	2.6		mg/L			1	SM 2540D

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ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1317	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-28-SP-105	5/26/2012	7:00	water	Grab	3	X																	
PRR1WATGACE-28-SP-106	5/26/2012	7:05	water	Grab	3	X																	
PRR1WATGACE-28-SP-109	5/26/2012	7:10	water	Grab	3	X																	
PRR1WATCME-57	5/26/2012	7:15	water	Grab	1		X																
PRR1WAT-28-SP-101	5/26/2012	7:20	water	Grab	1		X																
TB05262012	5/26/2012		water	-	3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
MATT McKeel	5-26-12	720	Craig A. Burns Jr			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig A. Burns Jr	5/26/12	1200	5-29-12 0830			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

05/30/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1334 (200-11101)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17587R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1334 (200-11101) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-29-SP-105	200-11101-1	Water	6/1/2012		X				
PRR1WATGACE-29-SP-107	200-11101-2	Water	6/1/2012		X				
PRR1WATGACE-29-SP-111	200-11101-3	Water	6/1/2012		X				
PRR1WATCME-58	200-11101-4	Water	5/28/2012						X
PRR1WAT-29-SP-101	200-11101-5	Water	6/1/2012						X
TB06012012	200-11101-6	Water	6/1/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

The MS/MSD analysis was not performed on a sample location from within this SDG.

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-29-SP-105	Chlorobenzene	8700 E	8400 D	8400 D
PRR1WATGACE-29-SP-107	Chlorobenzene	3500 E	2900 D	2900 D
PRR1WATGACE-29-SP-111	Chlorobenzene	6600 E	5800 D	5800 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 < calibration range	DJ
Diluted sample result > calibration range	EDJ

Reported Sample Results	Qualification
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 16, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 30, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1334 - VOCs

ANALYTE	Units	PRR1WATGACE-29-SP-107	LQ	VQ	PRR1WATGACE-29-SP-111	LQ	VQ	PRR1WATGACI-29-SP-105	LQ	VQ
2-Butanone	ug/L	1300			820			690		
Chlorobenzene	ug/L	2900 D	B	D	5800 D	B	D	8400 D	B	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1334 - Miscellaneous

ANALYTE	Units	PRR1WAT-29-SP-101	LQ	VQ	PRR1WATCME-58	LQ	VQ
Total Suspended Solids	mg/L	66.5			40.4		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-29-SP-107

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 36.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1300	
108-90-7	Chlorobenzene	2900 ~~3500~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-29-SP-107D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 251.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1300	J D
108-90-7	Chlorobenzene	2900	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-29-SP-111

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB16.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 70.4

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	820	
108-90-7	Chlorobenzene	5800 ~~6600~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-29-SP-111D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB15.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 488.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	850	J D
108-90-7	Chlorobenzene	5800	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-29-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 96.7

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	690	
108-90-7	Chlorobenzene	8400 ~~8700~~	~~E B~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-29-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 676.9

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	890	J D
108-90-7	Chlorobenzene	8400	D B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB06012012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1334

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11101-6

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPB18.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/04/2012

% Moisture: not dec. Date Analyzed: 06/04/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.061	J B

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WATCME-58 Lab Sample ID: 200-11101-4

Lab Name: TestAmerica Burlington Job No.: 200-11101-2

SDG ID.: PRR1334

Matrix: Water Date Sampled: 05/28/2012 18:15

Reporting Basis: WET Date Received: 06/04/2012 08:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	40.4	1.9		mg/L			1	SM 2540D

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-29-SP-101 Lab Sample ID: 200-11101-5

Lab Name: TestAmerica Burlington Job No.: 200-11101-2

SDG ID.: PRR1334

Matrix: Water Date Sampled: 06/01/2012 10:30

Reporting Basis: WET Date Received: 06/04/2012 08:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	66.5	3.2		mg/L			1	SM 2540D

ARCADIS
Infrastructure, environment, buildings

ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1334	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-29-SP-105	6/1/2012	10:25	water	Grab	3	X																	
PRR1WATGACE-29-SP-107	6/1/2012	10:15	water	Grab	3	X																	
PRR1WATGACE-29-SP-111	6/1/2012	10:10	water	Grab	3	X																	
PRR1WATCME-58	5/28/2012	18:15	water	Grab	1		X																
PRR1WAT-29-SP-101	6/1/2012	10:30	water	Grab	1		X																
TB06012012	6/1/2012		water		3	X																	

	Requested Analyses
1	2-Butanone, Chlorobenzene
2	TSS
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☐ Cooler packed with ice

☐ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp:

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig L. Burns Jr.	6/1/12	1340	Craig L. Burns Jr.			
Craig L. Burns Jr.	6/1/12	1350	6/4/12 0820			

06/05/2012

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TIERRA SOLUTIONS, INC. – Removal Action Work Plan

Data Verification/Validation Report

NEWARK, NEW JERSEY

Volatile and Miscellaneous Analysis

SDG# PRR1336 (200-11114)

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #17588R
Project: B0009966.0002.70006

SUMMARY

This data quality verification/validation report summarizes the review of Sample Delivery Group (SDG) # PRR1336 (200-11114) for samples collected in association with the Tierra Solutions, Inc. – Lower Passaic River Study Area and Newark Bay Study Area. Data were reviewed in accordance with Environmental Data Services and ARCADIS SOPs applicable to the analytical methods associated with this SDG.

This report contains the results of the data evaluation as per the above SOPs including relative achievement of data quality objectives and project specific measurement performance criteria. Review of data package completeness was also performed. Also included with this evaluation are the verification/validation tables, 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	MISC
PRR1WATGACI-30-SP-105	200-11114-1	Water	6/2/2012		X				
PRR1WATGACE-30-SP-107	200-11114-2	Water	6/2/2012		X				
PRR1WATGACE-30-SP-108	200-11114-3	Water	6/2/2012		X				
PRR1WATGACE-30-SP-110	200-11114-4	Water	6/2/2012		X				
PRR1WATGACE-30-SP-111	200-11114-5	Water	6/2/2012		X				
PRR1WAT-30-SP-101	200-11114-6	Water	6/2/2012						X
TB06022012	200-11114-7	Water	6/2/2012		X				

Notes:

1. VOC – Volatile Organic Compounds by USEPA Method SOM0.1.2
2. MISC - Miscellaneous analyses include Total Suspended Solids (TSS) by Standard Methods (SM) 2540D

ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Sample receipt condition		X		X	
Requested analyses and sample results		X		X	
Collection Technique (grab, composite, etc.)		X		X	
Methods of analysis		X		X	
Reporting limits		X		X	
Sample collection date		X		X	
Laboratory sample received date		X		X	
Sample preservation verification (as applicable)		X		X	
Sample preparation/extraction/analysis dates		X		X	
Fully executed Chain-of-Custody (COC) form completed		X		X	
Narrative summary of QA or sample problems provided		X		X	
Data Package Completeness and Compliance		X		X	

QA - Quality Assurance

VOLATILE DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1a. HOLDING TIME

The amount of a compound can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse blanks measure cores contamination 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.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target compound values were observed in any associated blanks at or above the project quantitation limits (PQL) during volatile analysis. 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. Target compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL. Therefore, qualification of the sample results was not required.

3. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analysis to evaluate overall laboratory performance and efficiency of the analytical technique.

Reported sample analyses and method blanks exhibited associated surrogate recoveries within the established acceptance limits.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The MS and MSD are generated to determine the precision and accuracy of the analytical procedure in a given matrix.

Sample location PRR1WATGACE-30-SP-107 was used in the MS/MSD analysis. The MS/MSD analysis exhibited acceptable recoveries and RPDs between the MS and MSD results

5. FIELD DUPLICATE 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 relative percent difference (RPD) between the parent sample and field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

6. REPORTING

This SDG does not contain any re-analyses. The samples were diluted prior to analysis due to high analyte concentrations; however, the laboratory reporting limits met the PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan. Sample results (in µg/L) associated with compounds that exhibited concentrations greater than the linear range of the instrument calibration and/or exhibited higher concentrations of detected compounds in the methanol-extracted analysis are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PRR1WATGACI-30-SP-105	Chlorobenzene	4400 E	4000 D	4000 D
PRR1WATGACE-30-SP-107	Chlorobenzene	3900 E	3100 D	3100 D
PRR1WATGACE-30-SP-108	Chlorobenzene	5500 E	3700 D	3700 D
PRR1WATGACE-30-SP-110	Chlorobenzene	9000 E	8700 D	8700 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

Reported Sample Results	Qualification
Diluted sample result < calibration range	DJ
Diluted sample result > calibration range	EDJ
Original sample result > calibration range	EJ

7. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

8. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
D	Sample was analyzed at a higher dilution factor.
E	Compound concentration exceeds the upper level of the calibration range of the instrument for that specific analysis.
J	Indicates an estimated value.
P	The % Difference between columns is greater than 25%.
U	Analyzed for but not detected.

9. Overall Assessment

Overall 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.

TSS DATA VERIFICATION VALIDATION REPORT

SUMMARY OF FINDINGS

Major

None.

Minor

None.

1. HOLDING TIME

The amount of an analyte can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid.

The analyses performed on the samples in this sample delivery group (SDG) were done within the technical holding time.

2. BLANK CONTAMINATION

Quality assurance blanks, method, trip, field, or rinse/equipment blanks are prepared to identify any contamination, which may have been introduced into the samples during preparation or field activity. Method blanks measure lab contamination. Field and rinse/equipment blanks measure cross-contamination during field operations.

Method Blank Contamination

Method blanks were performed at the proper frequency. No target analyte values were observed in the method blank at or above the PQL during TSS analysis.

3. LABORATORY CONTROL SAMPLE (LCS)

The LCS is a quality control sample of known concentration, which is processed along with a batch of samples. The percent recovery of the LCS can be used to assess the accuracy of the analytical procedure performed by a specific individual, during a specific time period, and utilizing the same reagents and equipment as those used for sample analyses.

LCSs were processed at the proper frequency. Upon evaluation, all analytes were successfully recovered during each of the LCS determinations.

4. MATRIX SPIKE (MS)

The MS are generated to determine the accuracy of the analytical procedure in a given matrix.

The MS analysis was not performed on a sample location within this SDG.

5. DUPLICATE

The duplicate sample analysis is performed to determine long-term precision of the analytical method in a given matrix. The relative percent difference between the sample and its duplicate may be used to qualify data.

The laboratory duplicate sample analysis was not performed on a sample location within this SDG.

6. FIELD DUPLICATE

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 field duplicate results. 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.

A field duplicate sample analysis was not performed on a sample location within this SDG.

7. REPORTING

This SDG does not contain re-extraction, re-analysis or dilution. The contract laboratory (TestAmerica) reporting limits met the corresponding PQLs stated in Worksheet 15 of the Phase I Removal Action Quality Assurance Project Plan.

8. ANALYTICAL METHODS AND PROCEDURES

No deviations from the analytical method were noted.

9. STANDARD LABORATORY QUALIFIERS

The laboratory qualifiers as defined by the laboratory are provided below.

Qualifier	Description
B	The analyte was found in an associated blank, as well as in the sample.
E	The reported value is estimated because of the presence of interference based on serial dilution analysis.
J	Sample result is greater than the MDL but below the CRDL
U	Analyzed for but not detected.
*	Duplicate analysis not within control limits

10. Overall Assessment

Overall 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.

VALIDATION/VERIFICATION PERFORMED BY: Dennis Dyke
Project Scientist

SIGNATURE: 

DATE: October 16, 2012

PEER REVIEW: Joseph C. Houser

DATE: October 31, 2012

VERIFICATION/VALIDATION DATA TABLES

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1336 - VOCs

ANALYTE	Units	PRR1WATGACE-30-SP-107	LQ	VQ	PRR1WATGACE-30-SP-108	LQ	VQ	PRR1WATGACE-30-SP-110	LQ	VQ
2-Butanone	ug/L	1600			800			2000		
Chlorobenzene	ug/L	3100	D	D	3700	D	D	8700	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1336 - VOCs

ANALYTE	Units	PRR1WATGACE-30-SP-111	LQ	VQ	PRR1WATGACI-30-SP-105	LQ	VQ
2-Butanone	ug/L	1900			610		
Chlorobenzene	ug/L	290			4000	D	D

Verification Validation Data Table
Removal Action Phase I - RAWP QAPP
Test America
PRR-1336 - Miscellaneous

ANALYTE	Units	PRR1WAT-30-SP-101	LQ	VQ
Total Suspended Solids	mg/L	37.7		

SAMPLE ANALYSIS DATA SHEETS AND COCs

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-30-SP-107

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC13.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1600	
108-90-7	Chlorobenzene	3100 ~~3900~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PRR1WATGACE-30-SP-107D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-2

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC12.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 293.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1200	J D
108-90-7	Chlorobenzene	3100	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-30-SP-108

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC20.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 73.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	800	
108-90-7	Chlorobenzene	3700 ~~5500~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-30-SP-108D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-3

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC19.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 517.6

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	690	J D
108-90-7	Chlorobenzene	3700	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-30-SP-110

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC23.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 110.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	2000	
108-90-7	Chlorobenzene	8700 ~~9000~~	E D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-30-SP-110D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-4

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC22.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 800.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	2300	J D
108-90-7	Chlorobenzene	8700	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACE-30-SP-111

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-5

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC26.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 40.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	1900	
108-90-7	Chlorobenzene	290	

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-30-SP-105

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC10.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 60.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	610	
108-90-7	Chlorobenzene	4000 ~~4400~~	~~E~~ D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PRR1WATGACI-30-SP-105D

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-1

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC09.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 440.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	670	J D
108-90-7	Chlorobenzene	4000	D

Report 1,4-Dioxane for Low-Medium VOA analysis only

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TB06022012

Lab Name: TESTAMERICA BURLINGTON Contract: LPRSA

Lab Code: TABVT Case No.: RAPHAS Mod. Ref No.: SDG No.: PRR1336

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-11114-7

Sample wt/vol: 25.0 (g/mL) mL Lab File ID: DIPC28.D

Level: (TRACE/LOW/MED) TRACE Date Received: 06/05/2012

% Moisture: not dec. Date Analyzed: 06/05/2012

GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 25.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-93-3	2-Butanone	5.0	U
108-90-7	Chlorobenzene	0.041	J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: PRR1WAT-30-SP-101 Lab Sample ID: 200-11114-6

Lab Name: TestAmerica Burlington Job No.: 200-11114-2

SDG ID.: PRR1336

Matrix: Water Date Sampled: 06/02/2012 19:11

Reporting Basis: WET Date Received: 06/05/2012 09:40

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
	Total Suspended Solids	37.7	1.9		mg/L			1	SM 2540D

ARCADIS
Infrastructure, environment, buildings
ARCADIS
6723 Towpath Rd
Syracuse, NY 13214
Phone/Fax: (315) 671-9688

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

PROJ. NO.	PROJECT NAME	SDG NUMBER	COC Number
B0009966.0002.70004	Tierra Phase I Removal	PRR1336	

SAMPLERS: CHES

SAMPLE ID	DATE	TIME	MATRIX	Composite/Grab	# Containers	Requested Analyses 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Remarks
PRR1WATGACI-30-SP-105	6/2/2012	19:08	water	Grab	3	X																	
PRR1WATGACE-30-SP-107	6/2/2012	19:02	water	Grab	9	X																	MS/MSD
PRR1WATGACE-30-SP-108	6/2/2012	18:49	water	Grab	3	X																	
PRR1WATGACE-30-SP-110	6/2/2012	19:34	water	Grab	3	X																	
PRR1WATGACE-30-SP-111	6/2/2012	19:40	water	Grab	3	X																	
PRR1WAT-30-SP-101	6/2/2012	19:11	water	Grab	1		X																
TB06022012	6/2/2012		water	_	3	X																	

Requested Analyses

1. 2-Butanone, Chlorobenzene
2. TSS
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.

Special Instructions/Comments:

☐ Special QA/QC Instructions

Laboratory Information and Receipt

Lab Name: TestAmerica -Burlington, VT

Shipping Tracking #

Specify Turnaround Requirements: 24 hr TAT

☑ Cooler packed with ice

☑ Cooler custody seal intact

Sample Receipt:

Condition/Cooler Temp: 3.8°C

Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
	06/2/12	1938	Craig J. Brown Jr.			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:
Craig J. Brown Jr.	6/4/12	0745	6/4/12 0940			
Relinquished by:	DATE	TIME	Received by:	Relinquished by:	DATE	Received by:

06/06/2012