

LABORATORY DATA CONSULTANTS, INC.

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ERM

March 17, 2008

2525 Natomas Park Drive, Suite 350 Sacramento, CA 95833 ATTN: Ms. Maria Barajas-Albalawi

SUBJECT: BRC Tronox Parcel H, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the final validation reports for the fractions listed below. This SDG was received on February 29, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18356:

SDG# **Fraction**

F8A260143

Volatiles, Semivolatiles, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Gasoline Range Organics, Diesel Range Organics, Dioxins/Dibenzofurans, Wet Chemistry

The data validation was performed under EPA Level III and Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto

Operations Manager/Senior Chemist

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BRC Tronox Parcel H Data Validation Reports LDC# 18356

Volatiles

Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 10, 2008

Matrix:

Soil/Water

Parameters:

Volatiles

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

TSB-HJ-01-10'

TSB-TB-04-1/25/08

TSB-HJ-09-0'

RINSATE-1

TSB-HJ-09-10'

RINSATE-1RE

TSB-HJ-03-0'

TRIP BLANK-TB-05

TSB-HJ-03-0'-FD

TSB-HJ-02-10'MS

TSB-HJ-03-10'

TSB-HJ-02-10'MSD

TSB-HR-03-0'

TSB-HJ-01-0'MS

TSB-HR-03-10'**

TSB-HJ-01-0'MSD

TSB-HJ-02-0'**

RINSATE-1MS

TSB-HJ-02-10'**

RINSATE-1MSD

RINSATE-1REMS

TSB-HR-02-0'** TSB-HR-02-10'**

RINSATE-1REMSD

TSB-HJ-11-0'**

TSB-HJ-11-10'

TSB-HJ-11-10'-FD

TSB-HR-01-0'

TSB-HR-01-10'

TSB-HJ-01-0'

TSB-TB-2-1/25/08

TSB-TB-03-1/25/08

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 soil samples and 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990.

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
1/21/08	Dibromomethane	0.04510 (≥0.05)	All water samples in SDG F8A260143	J (all detects) UJ (all non-detects)	А
1/30/08	Ethanol	0.00855 (≥0.05)	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05 8031135-Blank	J (all detects) UJ (all non-detects)	Α
2/6/08	Ethanol	0.00366 (≥0.05)	All soil samples in SDG F8A260143	J (all detects) UJ (all non-detects)	Α

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
1/30/08	Bromomethane	48.37592	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05 8031135-Blank	J+ (all detects)	A
2/8/08	Ethanol 2,2-Dimethylpentane 2,4-Dimethylpentane	60.01099 33.49841 32.08794	TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0' TSB-HJ-01-0'MS TSB-HJ-01-0'MSD 8043261-Blank	J+ (all detects) J+ (all detects) J+ (all detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
1/21/08	lodomethane Vinyl acetate	33.60319 31.00872	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05 8031135-Blank	J+ (all detects) J+ (all detects)	А
1/21/08	Vinyl acetate	31.00872	RINSATE-1RE 8036136-Blank	J+ (all detects)	А
2/6/08	Bromomethane	34.53645	All soil samples in SDG F8A260143	J+ (all detects)	А
2/6/08	Acetonitrile	27.60270	All soil samples in SDG F8A260143	J- (all detects) UJ (all non-detects)	А

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
2/4/08	Dibromomethane	0.04878 (≥0.05)	RINSATE-1RE 8036136-Blank	J (all detects) UJ (all non-detects)	А
1/30/08	Dibromomethane	0.04735 (≥0.05)	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05 8031135-Blank	J (all detects) UJ (all non-detects)	A
2/7/08	Ethanol	0.00337 (≥0.05)	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HR-03-10' TSB-HR-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-0'** TSB-HJ-11-0'** TSB-HJ-02-10'MS TSB-HJ-02-10'MSD 8039077-Blank	J (all detects) UJ (all non-detects)	A
2/8/08	Ethanol	0.00586 (≥0.05)	TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0' TSB-HJ-01-0'MS TSB-HJ-01-0'MSD 8043261-Blank	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
8039077-Blank	2/7/08	Dichloromethane	13 ug/Kg	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HR-03-10' TSB-HR-03-10'** TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10'**
8031135-Blank	1/30/08	Dichloromethane	0.16 ug/L	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-HJ-01-10'	Dichloromethane	21 ug/Kg	21U ug/Kg
TSB-HJ-09-0'	Dichloromethane	15 ug/Kg	15U ug/Kg
TSB-HJ-09-10'	Dichloromethane	14 ug/Kg	14U ug/Kg
TSB-HJ-03-0'	Dichloromethane	14 ug/Kg	14U ug/Kg
TSB-HJ-03-0'-FD	Dichloromethane	12 ug/Kg	12U ug/Kg
TSB-HJ-03-10'	Dichloromethane	15 ug/Kg	15U ug/Kg
TSB-HR-03-0'	Dichloromethane	16 ug/Kg	16U ug/Kg
TSB-HR-03-10'**	Dichloromethane	15 ug/Kg	15U ug/Kg
TSB-HJ-02-0'**	Dichloromethane	12 ug/Kg	12U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-HJ-02-10'**	Dichloromethane	8.8 ug/Kg	8.8U ug/Kg
TSB-HR-02-0'**	Dichloromethane	7.1 ug/Kg	7.1U ug/Kg
TSB-HR-02-10'**	Dichloromethane	8.3 ug/Kg	8.3U ug/Kg
TSB-HJ-11-0'**	Dichloromethane	4.9 ug/Kg	5.2U ug/Kg
TSB-HJ-11-10'	Dichloromethane	6.8 ug/Kg	6.8U ug/Kg
TSB-TB-2-1/25/08	Dichloromethane	0.19 ug/L	1.0U ug/L
TSB-TB-03-1/25/08	Dichloromethane	0.14 ug/L	1.0U ug/L
TSB-TB-04-1/25/08	Dichloromethane	0.19 ug/L	1.0U ug/L
TRIP BLANK-TB-05	Dichloromethane	0.19 ug/L	1.0U ug/L

Samples TSB-TB-2-1/25/08, TSB-TB-03-1/25/08, TSB-TB-04-1/25/08, and TRIP BLANK-TB-05 were identified as trip blanks. No volatile contaminants were found in these blanks with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TRIP BLANK-TB-05	1/25/08	Dichloromethane Acetone	0.19 ug/L 4.7 ug/L	RINSATE-1 RINSATE-1RE
TSB-TB-2-1/25/08	1/25/08	Dichloromethane Acetone	0.19 ug/L 4.5 ug/L	TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'**
TSB-TB-03-1/25/08	1/25/08	Dichloromethane Acetone	0.14 ug/L 4.9 ug/L	TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HR-02-0'** TSB-HR-02-10'**
TSB-TB-04-1/25/08	1/25/08	Dichloromethane Acetone	0.19 ug/L 4.6 ug/L	TSB-HJ-11-0'** TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'

Samples "RINSATE-1" and "RINSATE-1RE" were identified as rinsates. No volatile contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE-1	1/25/08	Dichloromethane Ethyl ether	12 ug/L 2.2 ug/L	All soil samples in SDG F8A260143
RINSATE-1RE	1/25/08	Dichloromethane Acetone	10 ug/L 1.8 ug/L	All soil samples in SDG F8A260143

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-HJ-01-10'	Dichloromethane	21 ug/Kg	21U ug/Kg
TSB-HJ-09-0'	Dichloromethane	15 ug/Kg	15U ug/Kg
TSB-HJ-09-10'	Dichloromethane	14 ug/Kg	14U ug/Kg
TSB-HJ-03-0'	Dichloromethane Acetone	14 ug/Kg 11 ug/Kg	14U ug/Kg 21U ug/Kg
TSB-HJ-03-0'-FD	Dichloromethane	12 ug/Kg	12U ug/Kg
TSB-HJ-03-10'	Dichloromethane Acetone	15 ug/Kg 5.8 ug/Kg	15U ug/Kg 21U ug/Kg
TSB-HR-03-0'	Dichloromethane	16 ug/Kg	16U ug/Kg
TSB-HR-03-10'**	Dichloromethane	15 ug/Kg	15U ug/Kg
TSB-HJ-02-0'**	Dichloromethane	12 ug/Kg	12U ug/Kg
TSB-HJ-02-10'**	Dichloromethane Acetone	8.8 ug/Kg 9.7 ug/Kg	8.8U ug/Kg 21U ug/Kg
TSB-HR-02-0'**	Dichloromethane Acetone	7.1 ug/Kg 9.3 ug/Kg	7.1U ug/Kg 21U ug/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-HR-02-10'**	Dichloromethane Acetone	8.3 ug/Kg 9.5 ug/Kg	8.3U ug/Kg 21U ug/Kg
TSB-HJ-11-0'**	Dichloromethane	4.9 ug/Kg	5.2U ug/Kg
TSB-HJ-11-10'	Dichloromethane	6.8 ug/Kg	6.8U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
8036136-Blank	Bromofluorobenzene	126 (66-115)	All TCL compounds	J+ (all detects)	Р

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MS/MSD percent recoveries and relative percent differences (RPD) were not within QC limits for many compounds, the MS, MSD, or LCS percent recovery (%R) was within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recovery (%R) was not within QC limits for some compounds, the MS or MSD percent recoveries (%R) were within QC limits and no data were qualified.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of the report if data has been qualified.

XVI. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

	Concentration (ug/Kg)		` • • • ·		200	DW		
Compound	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P		
Dichloromethane	14	12	-	2 ug/Kg (≤5.3)	-	_		

	Concentra	ition (ug/Kg)		D			
Compound	Compound TSB-HJ-11-10'		RPD (Limits)	Difference (Limits)	Flag	A or P	
Dichloromethane	6.8	5.3U	•	1.5 ug/Kg (≤5.3)	-	-	

BRC Tronox Parcel H Volatiles - Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 RINSATE-1 RE TRIP BLANK-TB-05	Dibromomethane	J (all detects) UJ (all non-detects)	А	Initial calibration (RRF)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HJ-02-10'** TSB-HR-02-0'** TSB-HR-02-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HS-01-0' TSB-HR-01-0' TSB-HS-01-0' TSB-TB-01-1/25/08 TSB-TB-01-1/25/08 TSB-TB-01-1/25/08 TSB-TB-01-1/25/08 TSB-TB-01-1/25/08	Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8A260143	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05	Bromomethane	J+ (all detects)	А	Continuing calibration (%D)
F8A260143	TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'	Ethanol 2,2-Dimethylpentane 2,4-Dimethylpentane	J+ (all detects) J+ (all detects) J+ (all detects)	Α	Continuing calibration (%D)
F8A260143	TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05	lodomethane Vinyl acetate	J+ (all detects) J+ (all detects)	A	Continuing calibration (ICV %D)
F8A260143	RINSATE-1RE	Vinyl acetate	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HR-03-10' TSB-HR-03-10'** TSB-HJ-02-10'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HJ-11-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0' TSB-HJ-01-0'	Bromomethane	J+ (all detects)	A	Continuing calibration (ICV %D)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HJ-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-01-10'** TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'	Acetonitrile	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
F8A260143	RINSATE-1RE TSB-TB-2-1/25/08 TSB-TB-03-1/25/08 TSB-TB-04-1/25/08 RINSATE-1 TRIP BLANK-TB-05	Dibromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HR-03-10' TSB-HR-03-10'** TSB-HR-02-10'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0'	Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

BRC Tronox Parcel H Volatiles - Laboratory Blank Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A260143	TSB-HJ-01-10'	Dichloromethane	21U ug/Kg	Α
F8A260143	TSB-HJ-09-0'	Dichloromethane	15U ug/Kg	А
F8A260143	TSB-HJ-09-10'	Dichloromethane	14U ug/Kg	А
F8A260143	TSB-HJ-03-0'	Dichloromethane	14U ug/Kg	А
F8A260143	TSB-HJ-03-0'-FD	Dichloromethane	12U ug/Kg	А
F8A260143	TSB-HJ-03-10'	Dichloromethane	15U ug/Kg	А
F8A260143	TSB-HR-03-0'	Dichloromethane	16U ug/Kg	A
F8A260143	TSB-HR-03-10'**	Dichloromethane	15U ug/Kg	А
F8A260143	TSB-HJ-02-0'**	Dichloromethane	12U ug/Kg	А
F8A260143	TSB-HJ-02-10'**	Dichloromethane	8.8U ug/Kg	А
F8A260143	TSB-HR-02-0'**	Dichloromethane	7.1U ug/Kg	А

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A260143	TSB-HR-02-10'**	Dichloromethane	8.3U ug/Kg	А
F8A260143	TSB-HJ-11-0'**	Dichloromethane	5.2U ug/Kg	А
F8A260143	TSB-HJ-11-10'	Dichloromethane	6.8U ug/Kg	Α
F8A260143	TSB-TB-2-1/25/08	Dichloromethane	1.0U ug/L	Α
F8A260143	TSB-TB-03-1/25/08	Dichloromethane	1.0U ug/L	А
F8A260143	TSB-TB-04-1/25/08	Dichloromethane	1.0U ug/L	Α
F8A260143	TRIP BLANK-TB-05	Dichloromethane	1.0U ug/L	Α

BRC Tronox Parcel H Volatiles - Field Blank Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A260143	TSB-HJ-01-10'	Dichloromethane	21U ug/Kg	Α
F8A260143	TSB-HJ-09-0'	Dichloromethane	15U ug/Kg	Α
F8A260143	TSB-HJ-09-10'	Dichloromethane	14U ug/Kg	А
F8A260143	TSB-HJ-03-0'	Dichloromethane Acetone	14U ug/Kg 21U ug/Kg	А
F8A260143	TSB-HJ-03-0'-FD	Dichloromethane	12U ug/Kg	Α
F8A260143	TSB-HJ-03-10'	Dichloromethane Acetone	15U ug/Kg 21U ug/Kg	А
F8A260143	TSB-HR-03-0'	Dichloromethane	16U ug/Kg	A
F8A260143	TSB-HR-03-10'**	Dichloromethane	15U ug/Kg	А
F8A260143	TSB-HJ-02-0'**	Dichloromethane	12U ug/Kg	А
F8A260143	TSB-HJ-02-10'**	Dichloromethane Acetone	8.8U ug/Kg 21U ug/Kg	А

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A260143	TSB-HR-02-0'**	Dichloromethane Acetone	7.1U ug/Kg 21U ug/Kg	А
F8A260143	TSB-HR-02-10'**	Dichloromethane Acetone	8.3U ug/Kg 21U ug/Kg	Α
F8A260143	TSB-HJ-11-0'**	Dichloromethane	5.2U ug/Kg	А
F8A260143	TSB-HJ-11-10'	Dichloromethane	6.8U ug/Kg	А

VALIDATION COMPLETENESS WORKSHEET LDC #: 18356A1 SDG #: F8A260143 Level III/IV Laboratory: Test America

Reviewer: 2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	Δ	Sampling dates: 1 25 0 0
II.	GC/MS Instrument performance check	Δ	1 .
III.	Initial calibration	ىسى	% psp, (2 20.990
IV.	Continuing calibration/ICV	SW	KV = 25
V.	Blanks	حرب	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	رسی	
VIII.	Laboratory control samples	SW	LCS
iX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	ડ્ર	
XI.	Target compound identification	٨	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	4	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	Δ	Not reviewed for Level III validation.
XIV.	System performance	Δ	Not reviewed for Level III validation.
XV.	Overall assessment of data	۵	
XVI.	Field duplicates	~SW	D=4,5 14,15
XVII.	Field blanks	SW	R= 22, 23 TB = 24, 19, 20, 21

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

D = Duplicate

R = Rinsate

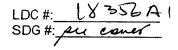
TB = Trip blank

FB = Field blank

EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

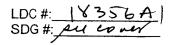
	SOIL	+ w	ator	,						
1 3	TSB-HJ-01-10'		113	TSB-HR-02-0'**	3	21	1 ∕ TSB-TB-04-1/25/08	W	312	RINSATE-1REMS W
2 3	TSB-HJ-09-0'		12 3	TSB-HR-02-10'**	2	22	RINSATE-1 ₩		32 2	RINSATE-1REMSD W
3 3	TSB-HJ-09-10'		13 3	TSB-HJ-11-0'**	3	23 V	RINSATE-1RE W		33 1	8031135
43	TSB-HJ-03-0'	1	143	TSB-HJ-11-10'	3	24	TRIP BLANK-TB-05	W	1 343	8039077
5 3	TSB-HJ-03-0'-FD	1	15 4	TSB-HJ-11-10'-FD ¹⁷	3	25 3	TSB-HJ-02-10'MS		35 2	8034134
6 3	TSB-HJ-03-10'	1	T6 4	TSB-HR-01-0'	3	26 3	TSB-HJ-02-10'MSD		- 36 4	8043261
₇ 3	TSB-HR-03-0'	1	174	TSB-HR-01-10'	3	27 4	TSB-HJ-01-0'MS		37	
83	TSB-HR-03-10'**	١	18 ¥	TSB-HJ-01-0'	3	284	TSB-HJ-01-0'MSD		38	
9 3	TSB-HJ-02-0'**	2	19 🕻	1 - Nonanal TSB-TB-2-1/25/08 W	1	29	RINSATE-1MS	W	39	
103	TSB-HJ-02-10'**	2	20 l	↑ TSB-TB-03-1/25/08 ✓	2.	30 1	RINSATE-1MSD	W	40	



VALIDATION FINDINGS CHECKLIST

Method: Volatiles (EPA SW 846 Method 8260B)

(2000)				
Validation Area	Yes	No	NA	Findings/Comments
[] Technical notding times by the bullette was a second of the second of				The second section of the second section is a second section of the second section section is a second section of the second section s
All technical holding times were met.	/			
Cooler temperature criteria was met.	<u> </u>			
ILSCMSInstrument perormance/stack in the same of the same state of			T	
Were the BFB performance results reviewed and found to be within the specified criteria?				
Were all samples analyzed within the 12 hour clock criteria?				
in single falls arong the second seco				
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?				
Was a curve fit used for evaluation?		·		
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?				
Were all percent relative standard deviations (%RSD) \leq 30% and relative response factors (RRF) \geq 0.05?				
Machine the second of the seco				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?				
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?				
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
MSUliosale salkes				
Were all surrogate %R within QC limits?	1			
f the percent recovery (%R) for one or more surrogates was out of QC limits, was a eanalysis performed to confirm samples with %R outside of criteria?			+	-
di Manie spike Majarespika grojestest				
Vere a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each natrix in this SDG? If no, indicate which matrix does not have an associated IS/MSD. Soil / Water.	1			
/as a MS/MSD analyzed every 20 samples of each matrix?	7		_	
/ere the MS/MSD percent recoveries (%R) and the relative percent differences RPD) within the QC limits?	W		-	
ili Uaboratoryidoliua) samplės (s. 1998).	l			
as an LCS analyzed for this SDG?	7	T	T	



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: P7
2nd Reviewer: V

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		_		
IX Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				
Kilinianal standards (1997) English and the standard (1997) English and the standards (1997) English and the standard (1997) English and the standar				
Were internal standard area counts within -50% or +100% of the associated calibration standard?				
Were retention times within + 30 seconds of the associated calibration standard?			erreng panang pa	
XKS Stolek esta i skulpisali skul				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?				
Did compound spectra meet specified EPA "Functional Guidelines" criteria?				
Were chromatogram peaks verified and accounted for?				
All Composition qualifications (GL)				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?		-		
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?		-		
XIII y panialivaly adamine decomes mais ([ISS) () and ()				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?				
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?				
Did the raw data indicate that the laboratory performed a library search for all equired peaks in the chromatograms (samples and blanks)?				
MAD ya kuni gerio menga sa tahun 1988 dan 1988 d				
System performance was found to be acceptable.				
vv.Coralkassa-samankondaka				
Overall assessment of data was found to be acceptable.				
Waged Applicate of a series of the series of				
ield duplicate pairs were identified in this SDG.	4			
arget compounds were detected in the field duplicates.	4			
VIDE and blanks				
eld blanks were identified in this SDG.	1	_		
arget compounds were detected in the field blanks.	1		十	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chioromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrie
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH, 1,4-Dloxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	22. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	00000
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	РРРР.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	GCC. tert-Butylbenzene	WWW. Ethanol	מססס.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	1111.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

^{* =} System performance check compounds (SPCC) for RRF; ** = Calibration check compounds (CCC) for %RSD.

SDG #: 100 Cons LDC#: \\ \2564\)

VALIDATION FINDINGS WORKSHEET **Initial Calibration**

Page: 2nd Reviewer: Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Did the laboratory perform a 5 point calibration prior to sample analysis?

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? Did the initial calibration meet the acceptance criteria?

	<u></u>			I		<u> </u>	 _	ī-	Ī		T	T	T	T	T	T	Т	ī	<u> </u>	T	1	T	I	T	ТТ	=
	Qualifications	A/m/r	7		3/u3/A			J/8n/2																		
	Associated Samples	8021135-8 Jank,	8036136 - Blank,	49-5 All water	80 31135 - Blank,	FZ 22 4- 61	-	4039077-Blank	8043261-Blank,	A1120115																
Were all %RSDs and RRFs within the validation criteria of ≤ 30 %RSD and ≥ 0.05 RRF?	Finding RRF (Limit: >0.05)	0.04510	0.0011		0.00855			0.00366																		
ion criteria of ≤30 %	Finding %RSD (Limit: <30.0%)	•	•																							
RES within the validat	Compound	RR	Elpano man		333			ک سس																		
Were all %RSDs and RRFs within the validation crite	Standard ID	ICAL			ICAL			1691																		
V NA MA	# Date	121 08	-		00 02 1	-		Ba 1/2	-				·													_

LDC# 18356A SDG #: ser cove

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: _ of_ Reviewer: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

δ × Σ ×

Rease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y AN N/A

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF?

ſ		7	_	T	_		1					_				1		, ,			 	 	 -		_
	Qualifications	1+/4 dist	11/A dat			1+/A 2ct				1+/ A det	1-/n7/A				1/103 A				1+/Aat	1/43/A					
	Associated Samples	8031135-Blank	4 8 944 08	A.H. wondery 19 - 19 22.	۲۲	8036136-BlK,	ዮ୯		2039017	8031135-Blank,	804341-Blank,	AN S0:15			8036136-Blank	23			8031135-Blank,	, ht 724 b					
	Finding RRF (Limit: >0.05)														0.04878					0.04735					
	Finding %D (Limit: <25.0%)	33.60319	31.00872			21.00872		•		34.53645	27.60270								48.31892						
	Compound	Indomethane	HH			H #				В	etee				RR				22	RR					
	Standard ID	1cv				1c V				16.1					aev				CC						
		1/21/08	-			1 21 08				20/1/2	-			-	क म क ह	22:01		-[:	7	14:32				-	
Ľ	#	+	+			+				+	1					- 1		-	+					1	

LDC #: 183824 SDG #: ser com

VALIDATION FINDINGS WORKSHEET Continuing Calibration

2nd Reviewer: Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

N_N/A

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". YN N/A

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

	T	T	T	T	T	T	T	T	T	Τ	Ī	T	T	T	T	Τ	T	T	T	Ī	Ī	Τ	T	Ī	Ι	Τ	T =
Qualifications	1/41/4								1/41/4	1+/A dat		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	A														
Associated Samples	8039077-Blank,	12 11 22 21							8043201-Blank,																		
Finding RRF (Limit: >0.05)	0.00337								0.00586																		
Finding %D (Limit: <25.0%)							*			60.01099	33. 4984)	22, 08794															
Compound	كسس								ω	$\mathcal{L}_{\mathcal{L}}$	2,2-Dimethylpentane	2.4- Dimethyldentane	ĺo														
Standard ID	ca								ددر		2,2-	2,4-															
# Date	80 4 ट	65;11							2 8 08	1 (5:11, +																	

SDG#: the conso LDC # 1 X DO PL

VALIDATION FINDINGS WORKSHEET

Field Blanks

je Je Page: 2nd Reviewer: Reviewer:

METHÓD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?
Blank units: vg | Kg
Associated sample units: vg | Kg
Field blank type: (circle one) Field Blank// Rinsate / Trip Blank / Other:

15/4 2 A 1 500 13 5.8/2 15/1 1 2 7/0,4 7/2 Sample Identification Associated Samples: 8.3/N - + . 7 7.1/4 2 <u>±</u> 12/19 8.8/N h 9 ス/d 2/2 σ Blank ID 23 12/08 7 <u>១</u> Blank ID 27 12/09 3, 4 or chlorome than e Compound Methylene enforter

E-faul E-faul

Accelone Chlereform CROL

X OL N 22,23 Associated Samples: Blank units: 100/L Associated sample units: 109/L/Field blank type) (circle one) Field Blank / Rinsate / Trip Blank / Other:

	7			Secondina Carriera			
Compound	Blank ID ⊅	Blank ID		Sample Identification	ntification		
	1/12/00						
Oich levone than e	6,19						
Acetone	4.7						
Chloroform							
CROL							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were also qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#: 18284 SDG #:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

2nd Reviewer:

Rease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Was a method blank associated with every sample in this SDG?

Was a method blank analyzed at least once every 12 hours for each matrix and concentration?

Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 2 7 08

Y N N/A Y N N/A

X X

Conc. units:

Associated Samples:

Compound	Blank ID				0	Semple Identification				
	4039077-						inon			
Usual per Contract	Blank	-	7	60	7	· ·	9.	1	•	0
Methylene chloride	13	21/4	M/ SI	2	1/71	12/18	17.	1, 1,	4	
Acetene	**				5	10/11	m/<1	- 10/14 -	18/14	14/11
								W		
						`				
CROL										
Conc. units: Ua Ka			Ą	Associated Samples:	į,		7 4			
Compound	Blank ID				8	Sample Identification	ation			
	Slank	0		71	71	1.1				
Methylene chloride	5	N/8.8	7.1.1	4.2/11	4.5/01.	N / / /				
Acetone				2/2/2	2	0.8				
		•								
logo									,	
וכחשר						•				

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were also qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 1838A

VALIDATION FINDINGS WORKSHEET

Page: 2nd Reviewer: Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". $\frac{Y}{X}$ N/A. Was a method blank associated with every sample in this SDG? Was a method blank analyzed at least once every 12 hours for each matrix and concentration?

Was there contamination in the method blanks? If yes, please see the qualifications below. Blank analysis date: 13009 Y/N N/A

Y /N N/A

Conc. units: May It

10-400 Associated Samples:

Conc. units: vall			As	Associated Samples:		19-422 24	ا ر		-
Compound	Blank ID	·				Sample Identification			
	5811803	2	C.						
8	Dianic	2	75	14	23	<u> </u>			
Methylene chloride	0.16	10.19/1.04 0.14		1104 0.19 1104 12	(2	0.19/1.00			
Asstone			_			\\.			
							-		
								 -	
								_	
ICROI.	1								

Blank analysis date: Conc. units:

Associated Samples:

Compound	Blank ID	Sample identification
Methylene chloride		
Acetone		
CROL		

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Mathylene chloride. Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were also qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

1 Syphal	120 S
FDC #	SDG #:

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: # of A Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Were field blanks identified in this SDG? Y N N/A

Were target compounds detected in the field blanks? Blank units: 49/1

Blank units: ペタル Associated sample units: ムタードア Field blank type: (circle one) Field Blank / Rinsate/ Trip Blank / Other

Ł

Sample Identification Associated Samples: 5,8/214 7/2 (2) t Blank ID Blank ID 195/09 0.19 4.5 Dichlorome thank Compound Methylene chloride **Chloroforn** Acetone CRQL

Blank units: 43// Associated sample units: 43/47 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:

7

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:	Field Blank	/ Rinsate ∕Tri	DBank / Othe	Jr:	Associ	Associated Samples:	11 11	1	
Compound	Blank ID $2Q$ Blank ID	Blank ID				Sample Identification	u		
5.11 (10.6 · 2) (1.11 · 2)	1/18/08		0/	11	12				
Dichloromethane Methylene chloride	6.14								
Acetone	64		19.7 /a/n	9.3/214	9.5/214				
Ghlomferm			,	_	,				
CROL						,			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were also qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC# 18 236 A SDG#:

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: A of & 2nd Reviewer:_ Reviewer:

> Were field blanks identified in this SDG? METHOD: GC/MS VOA (EPA SW 846 Method 8260B)
>
> Y N/N/A Were field blanks identified in this SDC

Were target compounds detected in the field blanks? Y N N/A

Blank units: 49//__Associated sample units: 49/// Field blank type: (circle one) Field Blank / Rinsate/Trip Blank) Other

+ON/ X/48 Sample Identification Associated Samples: Blank ID Blank ID 2 125 08 0.10 4.0 Pichloro methane Methylene chloride Compound **Chleroform** Acetone CROL

Associated sample units: Blank units:

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:

Associated Samples:

Compound	Blank ID	Blank ID		Sample Identification	ntification		
A Company of the Comp							
Methylene chloride							
Acetone							
Chloroform							
CROL				ŕ			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 18356A SDG #:

VALIDATION FINDINGS WORKSHEET Surrogate Spikes

Page: / of 2nd Reviewer:__ Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R out of outside of criteria?

	1	_	T	ī		т-	11		_	ı—	-		ii —		7	11	-	, .	· · · · · ·		
Qualifications	dr d/ts																				
-imits)	(66-115)	<u> </u>	()	()	<u> </u>	()	()	()	(· ·	(()	()	()	()	()	()	(()	()	(
%Recovery (Limits)	126					1111111															
Surrogate	BFB						•														
Sample ID	8036136-Blank																				
Date												-									
*																					

	QC Limits (Soil)	QC Limits
SMC1 (TOL) = Toluene-d8	81-117	88-11
SMC2 (BFB) = Bromofluorobenzene	74-121	86-11
SMC3 (DCE) = 1,2-Dichloroethane-d4	80-120	80-12
SMC4 (DFM) = Dibromofluoromethane	80-120	86-11

QC Limits (Water)	88-110	86-115	80-120	86-118
QC Limits (Soil)	81-117	74-121	80-120	80-120

LDC #: 1838A SDG #: Sec words

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A"

N/A

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits? Was a MS/MSD analyzed every 20 samples of each matrix?

	Date	OI OSW/SW	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limite)	Q 7	-
		25+26	B	(251-65) PSI		(2)	Associated Samples	- 11
			4	,		1	0	AN OWAL MADER
L			¥,			34 (30)		M5/pin
1			ر. اد			46		
\perp			D))	35 ()		
\bot			Ш	()	196 (30-12)	38 ()		W. J. M
L			#			,) ७५		0 ; 0/5W
\perp			G	(()	() X t		
			つ)		- \S		
			7	()		- T		
			ф	(()) 11		
- 1			S	(3,5		
			20	()		33 (
			RRR	()		41 (
			585	()	()	0000		
			EL EL	()	()	39		
- 1			뵤	()	()	34 (
			ΑΔ	()	()	36		
			III	()		39 (\)		
		Compound	puno	ac ri	QC Limits (Soil)	RPD (Soil)	OC Limits (Water)	ND (100 M)
	I	1,1-Dichloroethene		69	59-172%	< 22%	61-145%	(Marel)
	S.	Trichloroethene		62	62-137%	< 24%	71-120%	7.470
	>	Benzene		99	66-142%	< 21%	76-127%	< 11%
$^{\prime}$	00	Toluene		59	59-139%	< 21%	76-125%	7967
ال	DD.	Chlorobenzene		09	60-133%	< 21%	75 4000	0/01/
						2	0/ 1107	

LDC#: 1835BA SDG#: Sec we

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

2of Reviewer Page: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

N N/A

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated Plase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". MS/MSD. Soil / Water.

Was a MS/MSD analyzed every 20 samples of each matrix? Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

# Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Ouslifications
	22 + 20	323	(US 24 (5	7 0 V
		222	()		39 (
		22)) 43 (
		BBB	())) 88 (
		7,7	())	55 (
		ddd	(53 (54-135)			
		66	()	(Sh1-15) bh (
		ଷଷ			2		
		111				A	> -
		^ ^) 74 (
	-0	- cymene)) th (
		71,	()		3) (
		\h)	3%		
		爻) 25		
		AAA)	-			
	Indom	Indome thane	()		62 (20		<i>k</i> .
			())			>
			())) (
	Compound	punoc	QC Lir	Limits (Soll)	RPD (Soil)	OC Limite (Water)	(1777-W) Caa
ヹ	1,1-Dichloroethene		99	59-172%	< 22%	61-145%	(Make)
S.	Trichloroethene		62.	62-137%	< 24%	71,100%	14.00
>	Benzene		99	66-142%	< 21%	76-127%	7 14%
CCC	Toluene		59	59-139%	< 21%	76,125%	0/11
DD.	Chlorobenzene		Ca	60 1228/		0/071	0/10/

LDC #: 1838A SDG #: Sec we

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

6 Reviewer: Page: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". N/A

MS/MSD. Soil / Water.

Was a MS/MSD analyzed every 20 samples of each matrix?

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

MSMNSD ID Compound MR Land MSN MSD MSD									
ST4.2\(\text{S} \)	#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	(a) (imite)	,	
HH			30,00	\ \ \		(2)	ArD (LIMITS)	Associated Samples	Qualifications
HH	T		27 2 2	ł	72			81	m out we
P	1			HH	10)	())		_
P	T			В	(~		× × ×
K	1			۵	()	()	-		in the same
Chilerothromethane	\dashv			ᅶ	()	()	35, (W. Alexa
Chilatoperchane thank	╢			Ø	(()	3) (
R&B () () 34 () () 34 () () 37 () () <t< td=""><td>\dashv</td><td></td><td>chlorobron</td><td>nomethane</td><td>()</td><td>()</td><td>39 ()</td><td></td><td></td></t<>	\dashv		chlorobron	nomethane	()	()	39 ()		
FEE E	\dashv			ष्रवस्र))	7		
FEEE () () 27 (20)	\dagger			99	((3 (
HH	\dashv			EEE E	()	()	~		
() () () () () () () () () ()	\dashv			HH	()		-		, ,,,
Compound () () () () () () () () () ()	\dashv				())	-		או כאא יא
() () () () () () () () () ()	\dashv)	()			
Compound () () () () () () () () () ()	\dashv				()	()	()		
Compound QC Limits (Soil) RPD (Soil) 1,1-Dichloroethene 59-172% < 22%	+				()	()	()		
Compound QC Limits (Soil) RPD (Soil) 1,1-Dichloroethene 59-172% < 22%	\dashv				()	())		
Compound QC Limits (Soil) RPD (Soil) 1,1-Dichloroethene 59-172% < 22%	十				()	()	()		
Compound QC Limits (Soil) RPD (Soil) 1,1-Dichloroethene 59-172% < 22%	$-\parallel$				()	()	()		
1,1-Dichloroethene 59-172% < 22%			Сотрои	ınd	QC Limi	ts (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
Trichlaroethene 62-137% < 24% Benzene 66-142% < 21%		Ξ	1,1-Dichloroethene		59-1	72%	< 22%	61-145%	< 14%
Benzene 66-142% < 21% Toluene 59-139% < 21%		S.	Trichloroethene		62-1	37%	< 24%	71-120%	< 14%
Toluene 59-139% < 21% Chlorobenzene 60-139% < 21%		>	Benzene		66-1	42%	< 21%	76-127%	< 11%
Chlorobenzene		CC.	Toluene		59-1	39%	< 21%	76-125%	< 13%
00-1-35%		DD.	Chlorobenzene		60.1	%86	940		

LDC#: 1838A SDG #: Sec cover

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Reviewer: Page: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". A/N A/A

MS/MSD. Soil / Water.

Was a MS/MSD analyzed every 20 samples of each matrix?

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	ıits)	MSD %R (Limits)		RPD (Limits)	Accordated Samples	in Contract of the Contract of
+		9d+30	B	165 (2	(28-182)	(251-72) Lal	5		27	A C C C C
+			Т	~	^	(as1-11) ss	ĝ	12. (10)		
\dashv		Di chloro c	Dichlorone thane	क्ष भार	(34-25)		<u>5</u>	-		
+			MN	`)	^	(B) O	,	
\dashv				<u> </u>	()	_			7
╁))		()		
+				~	(•	_	()		
+				<u> </u>		<i>)</i>	~)		
+)	^			
+		3/+32	EFFE	~)	<u> </u>	38 (20)	7.3	ho out
+								()		25, 52
╁)		()		
+				<u> </u>)	_	()		
+				~	^)	_			
- -				`	^)	<u> </u>			
+				~)	()		
+				~)	(()		
-				<u> </u>	()		()		
		Сотроинд	nnd		QC Limits (Soil)	(lios) s		RPD (Soil)	QC Limits (Water)	RPD (Water)
	I	1,1-Dichloroethene			59-172%	72%		< 22%	61-145%	< 14%
	S.	Trichloroethene			62-137%	37%		< 24%	71-120%	< 14%
	>	Benzene			66-142%	12%		< 21%	76.127%	7440/
	CC.	Toluene			59-139%	%68		< 21%	76 1259/	0/
	.00	Chlorobenzene			60-133%	13%		< 21%	75.130%	< 13% 4.2%
			***************************************			***************************************			2/00/10/	W.C. 1

LDC #: 18356 P.)
SDG #: 16 (One)

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Page: Reviewer:

2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits? Was a LCS required?

			SO	LCSD			
Date	TCS/FCSD ID	Compound	%R (Limits)	%R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	•	_					

	٦	Π	T	T	-	2.	Ī	П		_	Ī													7
Qualifications	no out madin	5				no our malpin	MSin	n'i alem		→														
Associated Samples	8039017-BLK,	114				8043261-BLK,	814 51			->														
RPD (Limits)	()	()	(()	()	()	())	()	())	()	()	()	()	()	()	()	()	()	()	()	()
LCSD %R (Limits)	()	()	()		()	()	()	()	()	()	()	()	()	()	(()	()	()	()	()	()	()	()	()
LCS %R (Limits)	142 (53-140))	~	()	()	152 (59-133)	(2h1-65) bL1	(21-51) 64	_	_	-)	(()	()	()	()	()	()	()	()	()	()	()
Compound	В	Pichlop methane 153	-			J	B	1	77	888														
LCS/LCSD ID	80 39071-165	Pichlo				8043261 - LCS													A STATE OF THE STA					
# Date							·																	

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183	3
DC #:	DG #:

VALIDATION FINDINGS WORKSHEET Internal Standards

Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Were all internal standard area counts within -50 to +100% of the associated calibration standard? Please, see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

			 			_	 		·	 _	·	_	 			 .			 1
Qualifications	OSM JANO ON			^															
RT (Limits)			(4	/															
Area (Limits)	234335 (420232 - 1680918)	18109 3 (30463) - 121851	(\$45159-1857 1) PJT 28	·															
Internal Standard	FBZ	682	4000																
Sample ID	かて																		
Date																			
#								<u> </u>	 <u> </u>		<u> </u>			<u> </u>	<u>L</u>	<u> </u>	<u> </u>	<u> </u>	

(BCM) = Bromochloromethane (DFB) = 1,4-Difluorobenzene (CBZ) = Chlorobenzene-d5

(4DCB) = 1,4-Dichlorobenzene-d4 (2DCB) = 1,2-Dichlorobenzene-d4 (PFB) = Pentafluorobenzene

LDC #: 18350A/ SDG #: Sec Cover

VALIDATION FINDINGS WORKSHEET Field Duplicates

Pag é :	of	
Reviewer:_	مو	フ
2nd reviewer:_	10	

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

/ \		
Y)	N	N/A
Y	N	N/A

Were field duplicate pairs identified in this SDG?
Were target compounds detected in the field duplicate pairs?

	€-7 Concentrati	oning Kyr	Diffirence
Compound	4	<u> </u>	RPD
Dichloromethane	14	12	2 (= 5.3)
	Ç-3 Concentrați	one uglks, 5.3	diperene
Compound	l Li		RPD

	Ç-3 Concentrat	ion, uglkg, s.3	diperene
Compound	<u> </u>	15	
V	6.8	5,34	1.5 (45.3)

	Concentration ()	
Compound		RPD

	Concentration (
Compound		RPD
· ·		

183584 SDG #: LDC #:_

Initial Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

of of Reviewer: 2nd Reviewer: Page:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

 $RRF = (A_x)(C_{\mathbf{s}})(A_{\mathbf{s}})(C_x)$ average RRF = sum of the RRFs/number of standards %RSD = 100 * (S/X)

 $A_{\rm k}$ = Area of associated internal standard $C_{\rm k}$ = Concentration of internal standard A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

				Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
*	Standard ID	Calibration Date	Compound (Reference Internal Standard)	RRF (<i>SO</i> std)	RRF (50 std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD
-	À	2/0/0/2	Viny chlarid (1st internal standard)	19619.0	0.6196	0.67623	a 67623	Sast.7	15051.9
T				2.6825	2,682	2.67278	2-67278	5.11635	52911-5
1				1	2.13917	1.22191	122191	3.97087	
7			272 - P. nettral genter to	(1200) 0.00386	0.00386	0.00366 0.00366	0.00366	14.5782	
			Dimerky Ors which de	0. Soy40	0,800 44J	0.76134	45191.0	25151:51	
\parallel			1、3、C - Re Bardard)	85018.1	asols-1	1-73263	1.13263	8.90652	2906.8
60			(1st internal standard)						
	,		(2nd internal standard)						
╢			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 18350A SDG#:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

ð Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF RRF = $(A_x)(C_x)/(A_x)(C_x)$

Where: ave. RRF = initial calibration average RRF RRF = continuing calibration RRF

 $A_{\rm b}$ = Area of associated internal standard $C_{\rm b}$ = Concentration of internal standard A_x = Area of compound, C_x = Concentration of compound,

					Reported	Recalculated	Reported	Recalculated
#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF	RRF (CC)	RRF	Q%	G %
-	xea LO118 2/7/08	80/L/c	Ving Chloride. (1st internal standard)	46.14.7.0	140110		6,0,0	Sedi.
	11:30	_	Extra Benzent.	2 1278	2 45.02	7 (100)	3.04%	8-0-4
			1,2 - 0CP. (Std internal standard)	7.22191	7.21637	7.21.27	7,84400	2.0.7.
7	XCA LONG	80/1/6	Ethano (1st internal standard)	0.00366	0.00237	0.00237	27.62.7	7 60 7
	11:59	-	Pincthy (2nd internal standard)	0.76124	0.74864	0-7486	0.000	0 KT8-)
			小ろ(こ、TC(A) (3rd Infernal standard)	1.7323	1-73879	1.73879	0.3557	1.6601
က			(1st internal standard)					186.0
			(2nd internal standard)					
			(3rd internal standard)					
4			(1st internal standard)					
		-	(2nd internal standard)					
			(3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the

VALIDATION FINDINGS WORKSHEET **Surrogate Results Verification**

Page:_	<u>/</u> of <u>/</u>
Reviewer:_	<i>*</i> 7
2nd reviewer:_	in

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found SS = Surrogate Spiked

Sample ID:___∕

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	50	49-1718	98	98	0
Bromofluorobenzene		47.0564	94	94	
1,2-Dichloroethane-d4		51.6740	103	103	
Dibromofluoromethane		56.0272	112	112	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane			·		

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene			·		
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 18350 A | SDG #: per count

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates Results Verification

Page: /of / Reviewer: £7

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration SA = Spike added

SC = Sample concentration

RPD = 1 MSC - MSDC 1 * 2/(MSC + MSDC)

MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample:

X + 26

	σ,	Spike	Sample	Spiked Sample	ample	Matrix Spike	Spike	Matrix Spike Duplicate	Duplicate	WS	MS/MSD
Compound	¥ ¾	Added valley)	Concentration (Mg/K)	Concentration (wa kx)	ration	Percent Recovery	ecovery	Percent Recovery	ecovery		RPD
	MS	MSD	,	MS	MSD	Reported	Recalc.	Reported	Recatc.	Reported	Recalculated
1,1-Dichloroethene	52.9	536	ON	53.5 15.5	aric	101	[0]	3	<u>-</u>	4.0	t 7
Trichloroethene		-		48.8	33.9	26	42	63	63	3	36
Benzene				43.9	32.5	80	83	61	[9	30	30
Toluene				42. C	30.5	- %	18	53	57	8	33
Chlorobenzene		>	- 3	43.0	0.16	18	(8	43.0	1 0	29	6%

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 18 356 A | SDG #: 18 356 A |

VALIDATION FINDINGS WORKSHEET Laboratory Control Sample Results Verification

Page: __ of __ Reviewer: ______ 2nd Reviewer: _______

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration SA = Spike added

RPD = ILCS - LCSD I* 2/(LCS + LCSD)

LCS = Laboraotry control sample percent recovery

LCS ID: 50 39017

LCSD = Laboratory control sample duplicate percent recovery

	,	7	7	T	-	1	†	1	1	T				_
080 //80	RPD	Podeline Jacob												
1/80	R	Donottod												
ū	ecovery	Pacalc												
I CSD	Percent Recovery	Renorted					7 7 3							
	ecovery	Recalc	∱ 11	001	B	90	86							
SUL	Percent Recovery	Reported	71	00	001	бъ	Xb	-						
ample	ration) I CSD	A0	_		ŕ		-						
Spiked S	Concentration (いか)女	l CS	57.	8.64	2.05	49.6	0.67	• •						
ž.	Added (ng /kg)	uso I	λĀ				\rightarrow		•					
Sp	Add (mg)	L CS	50.0				>							
	Compound		1,1-Dichloroethene	Trichloroethene	Benzene	Toluene	Chlorobenzene	-						

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. LDC #: 18350A | SDG #: pu coner

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: / of / 2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

N N/A N N/A

Were all reported results recalculated and verified for all level IV samples?

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

 $(A_x)(I_s)(DF)$ Concentration = $(A_{is})(\overline{RRF})(\overline{V_o})(\%S)$

Area of the characteristic ion (EICP) for the compound to be measured

Area of the characteristic ion (EICP) for the specific internal standard

Amount of internal standard added in nanograms

RRF Relative response factor of the calibration standard.

Volume or weight of sample pruged in milliliters (ml) V_o or grams (g).

Df Dilution factor.

%S Percent solids, applicable to soils and solid matrices Example:

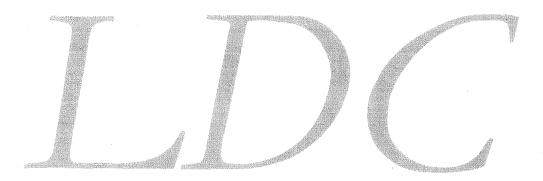
Sample I.D. #1 , _ E

Conc. = (13.88939 (5) (4.99) (0.94) (1) =

	only.		Reported Concentration	Calculated Concentration	
#	Sample ID	Compound	()	()	Qualification
		W - (12953) /1401	-0.17	68	
		50 (12933) (0.401	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ 	0	
		11 - 12 CA(92 G			
		y= 13.88939			
				-	
		***************************************		W. 1	
	•				
 					
		:			
	***************************************			-	

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Semivolatiles



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Semivolatiles

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'** TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HR-02-0'** TSB-HR-02-10'** TSB-HJ-11-0'** TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10'

TSB-HJ-01-0' RINSATE-1

TSB-HJ-02-10'MS

TSB-HJ-02-10'MSD TSB-HJ-01-0'MS

TSB-HJ-01-0'MSD RINSATE-1MS

RINSATE-1MSD

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990.

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all semivolatile target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/6/08	Pentachlorophenol	22.53156	All water samples in SDG F8A260143	None	Р
2/7/08 (KCAL4379)	Pentachlorophenol	21.13833	All soil samples in SDG F8A260143	None	Р

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/7/08 (KCAL4381)	N-Hydroxymethylphthalimide	26.61142	All soil samples in SDG F8A260143	J- (all detects) UJ (all non-detects)	А

The percent difference (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
8031298-Blank	1/31/08	Unknown aldol condensate (4.2679) Unknown aldol condensate (4.7594)	22000 ug/Kg 330 ug/Kg	All soil samples in SDG F8A260143

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported	Modified Final
	TIC (RT in minutes)	Concentration	Concentration
TSB-HJ-01-10'	Unknown aldol condensate (4.2684)	23000 ug/Kg	23000U ug/Kg
	Unknown aldol condensate (4.7652)	370 ug/Kg	370U ug/Kg
TSB-HJ-09-0'	Unknown aldol condensate (4.2734)	23000 ug/Kg	23000U ug/Kg
	Unknown aldol condensate (4.7649)	360 ug/Kg	360U ug/Kg
TSB-HJ-09-10'	Unknown aldol condensate (4.2635)	23000 ug/Kg	23000U ug/Kg
	Unknown aldol condensate (4.7604)	360 ug/Kg	360U ug/Kg
TSB-HJ-03-0'	Unknown aldol condensate (4.2732)	20000 ug/Kg	20000U ug/Kg
	Unknown aldol condensate (4.7701)	310 ug/Kg	310U ug/Kg
TSB-HJ-03-0'-FD	Unknown aldol condensate (4.2626)	20000 ug/Kg	20000U ug/Kg
	Unknown aldol condensate (4.7594)	310 ug/Kg	310U ug/Kg

Sample	Compound	Reported	Modified Final
	TIC (RT in minutes)	Concentration	Concentration
TSB-HJ-03-10'	Unknown aldol condensate (4.2643)	22000 ug/Kg	22000U ug/Kg
	Unknown aldol condensate (4.7612)	350 ug/Kg	350U ug/Kg
TSB-HR-03-0'	Unknown aldol condensate (4.2599)	23000 ug/Kg	23000U ug/Kg
	Unknown aldol condensate (4.7567)	360 ug/Kg	360U ug/Kg
TSB-HR-03-10'**	Unknown aldol condensate (4.2604)	23000 ug/Kg	23000U ug/Kg
	Unknown aldol condensate (4.7572)	360 ug/Kg	360U ug/Kg
TSB-HJ-02-0'**	Unknown aldol condensate (4.2789)	24000 ug/Kg	24000U ug/Kg
	Unknown aldol condensate (4.7704)	370 ug/Kg	370U ug/Kg
TSB-HJ-02-10'**	Unknown aldol condensate (4.2687)	25000 ug/Kg	25000U ug/Kg
	Unknown aldol condensate (4.7602)	400 ug/Kg	400U ug/Kg
TSB-HR-02-0'**	Unknown aldol condensate (4.2782)	24000 ug/Kg	2000U ug/Kg
	Unknown aldol condensate (4.7644)	390 ug/Kg	390U ug/Kg
TSB-HR-02-10'**	Unknown aldol condensate (4.2652)	24000 ug/Kg	24000U ug/Kg
	Unknown aldol condensate (4.762)	370 ug/Kg	370U ug/Kg
TSB-HJ-11-0'**	Unknown aldol condensate (4.259)	18000 ug/Kg	18000U ug/Kg
	Unknown aldol condensate (4.7611)	270 ug/Kg	270U ug/Kg
TSB-HJ-11-10'	Unknown aldol condensate (4.2631)	23000 ug/Kg	23000U ug/Kg
	Unknown aldol condensate (4.76)	370 ug/Kg	370U ug/Kg
TSB-HJ-11-10'-FD	Unknown aldol condensate (4.2606)	21000 ug/Kg	21000U ug/Kg
	Unknown aldol condensate (4.7574)	330 ug/Kg	330U ug/Kg
TSB-HR-01-0'	Unknown aldol condensate (4.2728)	25000 ug/Kg	25000U ug/Kg
	Unknown aldol condensate (4.7643)	380 ug/Kg	380U ug/Kg
TSB-HR-01-10'	Unknown aldol condensate (4.2701)	24000 ug/Kg	24000U ug/Kg
	Unknown aldol condensate (4.7616)	380 ug/Kg	380U ug/Kg
TSB-HJ-01-0'	Unknown aldol condensate (4.2714)	24000 ug/Kg	24000U ug/Kg
	Unknown aldol condensate (4.7629)	390 ug/Kg	390U ug/Kg

Sample "RINSATE-1" was identified as a rinsate. No semivolatile contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MS percent recoveries (%R) and MS/MSD relative percent differences (RPD) were not within QC limits for some compounds, the MSD percent recoveries (%R) were within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recovery (%R) was not within QC limits for one compound, the MSD percent recovery (%R) was within QC limits and no data were qualified.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report if data has been qualified.

XVI. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel H Semivolatiles - Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	RINSATE-1 TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HJ-03-10' TSB-HR-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0'	Pentachlorophenoi	None	Р	Continuing calibration (CCC %D)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HR-03-10' TSB-HR-03-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HJ-01-0'	N-Hydroxymethylphthalimide	J- (all detects) UJ (all non-detects)	Α	Continuing calibration (%D)

BRC Tronox Parcel H Semivolatiles - Laboratory Blank Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A260143	TSB-HJ-01-10'	Unknown aldol condensate (4.2684) Unknown aldol condensate (4.7652)	23000U ug/Kg 370U ug/Kg	А
F8A260143	TSB-HJ-09-0'	Unknown aldol condensate (4.2734) Unknown aldol condensate (4.7649)	23000U ug/Kg 360U ug/Kg	А

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A260143	TSB-HJ-09-10'	Unknown aldol condensate (4.2635) Unknown aldol condensate (4.7604)	23000U ug/Kg 360U ug/Kg	А
F8A260143	TSB-HJ-03-0'	Unknown aldol condensate (4.2732) Unknown aldol condensate (4.7701)	20000U ug/Kg 310U ug/Kg	А
F8A260143	TSB-HJ-03-0'-FD	Unknown aldol condensate (4.2626) Unknown aldol condensate (4.7594)	20000U ug/Kg 310U ug/Kg	А
F8A260143	TSB-HJ-03-10'	Unknown aldol condensate (4.2643) Unknown aldol condensate (4.7612)	22000U ug/Kg 350U ug/Kg	А
F8A260143	TSB-HR-03-0'	Unknown aldol condensate (4.2599) Unknown aldol condensate (4.7567)	23000U ug/Kg 360U ug/Kg	А
F8A260143	TSB-HR-03-10'**	Unknown aldol condensate (4.2604) Unknown aldol condensate (4.7572)	23000U ug/Kg 360U ug/Kg	А
F8A260143	TSB-HJ-02-0'**	Unknown aldol condensate (4.2789) Unknown aldol condensate (4.7704)	24000U ug/Kg 370U ug/Kg	А
F8A260143	TSB-HJ-02-10'**	Unknown aldol condensate (4.2687) Unknown aldol condensate (4.7602)	25000U ug/Kg 400U ug/Kg	А
F8A260143	TSB-HR-02-0'**	Unknown aldol condensate (4.2782) Unknown aldol condensate (4.7644)	2000U ug/Kg 390U ug/Kg	А
F8A260143	TSB-HR-02-10'**	Unknown aldol condensate (4.2652) Unknown aldol condensate (4.762)	24000U ug/Kg 370U ug/Kg	А
F8A260143	TSB-HJ-11-0'**	Unknown aldol condensate (4.259) Unknown aldol condensate (4.7611)	18000U ug/Kg 270U ug/Kg	А
F8A260143	TSB-HJ-11-10'	Unknown aldol condensate (4.2631) Unknown aldol condensate (4.76)	23000U ug/Kg 370U ug/Kg	А
F8A260143	TSB-HJ-11-10'-FD	Unknown aldol condensate (4.2606) Unknown aldol condensate (4.7574)	21000U ug/Kg 330U ug/Kg	А
F8A260143	TSB-HR-01-0'	Unknown aldol condensate (4.2728) Unknown aldol condensate (4.7643)	25000U ug/Kg 380U ug/Kg	А
F8A260143	TSB-HR-01-10'	Unknown aldol condensate (4.2701) Unknown aldol condensate (4.7616)	24000U ug/Kg 380U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A260143	TSB-HJ-01-0'	Unknown aldol condensate (4.2714) Unknown aldol condensate (4.7629)	24000U ug/Kg 390U ug/Kg	A

BRC Tronox Parcel H Semivolatiles - Field Blank Data Qualification Summary - SDG F8A260143

No Sample Data Qualified in this SDG

LDC #: 18356A2	VALIDATION COMPLETENESS WORKSHEET
SDG #: F8A260143	Level III/IV
Laboratory: Test America	

Reviewer: 2nd Reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	Δ	Sampling dates: 1 25 08
II.	GC/MS Instrument performance check	Δ	
111.	Initial calibration	Δ	1/0 PSD (2 20.990
IV.	Continuing calibration/ICV	sw _	<u> </u>
V.	Blanks	A	<u> </u>
VI.	Surrogate spikes	Δ	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	ىسى	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	Δ	
XI.	Target compound identification	Δ	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	Δ	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	Δ	Not reviewed for Level III validation.
XIV.	System performance	Δ	Not reviewed for Level III validation.
XV.	Overall assessment of data	Δ	
XVI.	Field duplicates	ND	D=4+5 14+1
XVII.	Field blanks	NP	R = 19

Note:

A = Acceptable

ND = No compounds detected R = Rinsate

D = Duplicate

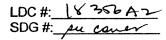
N = Not provided/applicable SW = See worksheet

FB = Field blank

TB = Trip blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

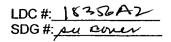
vanue	SOLL + water		derwent Level IV Validation				<u> </u>
1 1	TSB-HJ-01-10'	11	TSB-HR-02-0'**	21	TSB-HJ-02-10'MSD	31 1	8029233
2	TSB-HJ-09-0'	12	TSB-HR-02-10'**	22	TSB-HJ-01-0'MS	32	8031298
 3	TSB-HJ-09-10'	13	TSB-HJ-11-0'**	23	TSB-HJ-01-0'MSD	33	
4	TSB-HJ-03-0'	14	TSB-HJ-11-10'	24 1	RINSATE-1MS ₩	34	
5	TSB-HJ-03-0'-FD	15	TSB-HJ-11-10'-FD	25 լ	RINSATE-1MSD W	35	
6	TSB-HJ-03-10'	16	TSB-HR-01-0'	26		36	
7	TSB-HR-03-0'	17	TSB-HR-01-10'	27		37	
8	TSB-HR-03-10'**	<u>-</u> 18	TSB-HJ-01-0'	28		38	
1 12 13 4 15 6 17 18 19 10	TSB-HJ-02-0'**	191	RINSATE-1	29		39	
î 10	TSB-HJ-02-10'**	20	TSB-HJ-02-10'MS	30		40	



VALIDATION FINDINGS CHECKLIST

Method: Semivolatiles (EPA SW 846 Method 8270C)

metnod: Semivolatiles (EPA SW 846 Method 8270C)	T	ř –		
Validation Area	Yes	No	NA	Findings/Comments
i regional colorines				
All technical holding times were met.	/			
Cooler temperature criteria was met.	_			
UMBS/NB-Maminterio tentime tenences				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?			77 TO 1877 F. S.	
Preprior expansion				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Was a curve fit used for evaluation?				
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?	/			
Were all percent relative standard deviations (%RSD) < 30% and relative response factors (RRF) > 0.05?				
Discontinuore data ette tu				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?				
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?				
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?		/	_	
Was a method blank associated with every sample in this SDG?		-		
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	/			
ra sangpegrike				
Were all surrogate %R within QC limits?		_		
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			/	_
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			7	
Visitantiscissions sile unitsies				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII bala centay abah at selman-s				
Was an LCS analyzed for this SDG?				



VALIDATION FINDINGS CHECKLIST

Page: 2 of 7 Reviewer: 7 2nd Reviewer: _____

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?			-	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
PA Regulate Carlinas su en cara de calla Estado				
Were performance evaluation (PE) samples performed?			_	
Were the performance evaluation (PE) samples within the acceptance limits?				
X (Michalistica)				
Were internal standard area counts within -50% or +100% of the associated calibration standard?		_		
Were retention times within ± 30 seconds from the associated calibration standard?				
XII Jange Cooripounde de diline iron				
Were relative retention times (RRTs) within ± 0.06 RRT units of the standard?	W		_	-
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	JAN			
Were chromatogram peaks verified and accounted for?		مهما		
Ali Seintelia kija in Egovia kolus				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	•			-
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
All Feritality (see ningales med interior)			5	
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	_			
Were relative intensities of the major ions within \pm 20% between the sample and the reference spectra?				
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	1			
ity, systemics formers.				
System performance was found to be acceptable.	Constitution of the	Disconstant West		
Augine Allers secondario success				
	7			
Overall assessment of data was found to be acceptable.				
N. Research				
Field duplicate pairs were identified in this SDG.	_			
arget compounds were detected in the field duplicates.				
Modeleccianis de applicación de la companya de la c				
rield blanks were identified in this SDG.				·
arget compounds were detected in the field blanks.				

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butyibenzyiphthalate	PPP, Benzoic Acid
l. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	00. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TIT. N- & Hydroxy methy!
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	unu phthalimide
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethyiphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

SDG #: Local Complete Color (EPA SW 846 Method 8270C) LDC # 1 K356A2

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: / of

2nd Reviewer:__ Reviewer:___

원횻ase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

A/Z/Z

Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument? Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's? Were all %D and RRFs within the validation criteria of <25 %D and <2005 RRF?

Associated Samples Qualifications	3	9233-BIK	7		All 80:15+ Mare 10	· 81K		J/145/A							
Finding %D Finding RRF (Limit: 225.0%) (Limit: 20.05)) 9	\Box			21. 13833 (600)			36.61142							
Compound					11			777							
Standard ID	4CAL4350				KCAL4379			KCAL4381							
# Date	2				8012	-		1 2 2 0 0							

LDC # 1838A2

VALIDATION FINDINGS WORKSHEET

2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Pease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a method blank analyzed for each matrix?

Was a method blank analyzed for each concentration preparation level?

Was a method blank associated with every sample? Y N N/A

 $\frac{\gamma}{N}$ N/A Was the blank contaminated? If yes, please see qualification below. Slank extraction date: $\frac{1}{2}\frac{1}{3}\frac{1}{3}$

Associated Samples: Conc. units: പറ

Associated Samples: Blank extraction date: 1 राजि Blank analysis date: 2 7 0 डि Conc. units: walk

						•		
							-	
	tion							
	Sample Identification						,	
	Ó							
		 	(4.2714)	(4.7629)		,	•	•
		17	(4.2701) (4.2714)	14.7616)				
_								
	Blank ID				•			
-	Compound			→				

Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U"

LDC #: 1835 Az SDG #:

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page: 2nd Reviewer: Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Was a MS/MSD analyzed every 20 samples of each matrix? Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits? N/N/A N/N/A

			_	1	T-	T	ı —	T	T	Γ	T	Γ	ı —		ī	T	T
Qualifications	Jano Or	→					No out		7								
Associated Samples	۶)	7					0		->								
RPD (Limits)	11 1	(08).	^ _	<u> </u>	^ ·		(20)	- 32 ·	102) 94	· ·	_	<u> </u>	()	^	()	()	
ac.) 28 () 78 (7	7	7								
MSD %R (Umits)	(((
Ms %R (L)))	~))	- ₩))	-	_)	_	-		-
MS %R (Umits)	(16-d)	()	()	()	^	((76-82)	()	()	-	()	()	()	()	(<u> </u>
	8						9	ماا									
Compound	##	BB					七七	66	14.4					,			
MS/MSD ID	22 122						24+25										
Date																	
) *																	

		QC Limits	RPD	OC 1 imits	Caa			OC Imple	000	- H - 1 00	Caa
	Compound	(Soil)	(Soil)		(Water)		Compound	(Soil)	(Soll)	(Water)	(Water)
Ä	Phenol	26-90%	≈ 35%	12-110%	< 42%	g G	Acenaphthene	31-137%	≥ 19%	46-118%	< 31%
ci	C. 2-Chlorophenol	25-102%	%0g >	27-123%	≥ 40%	=	4-Nitrophenol	11-114%	< 50%	10-80%	× 20%
ш	1,4-Dichlorobenzene	28-104%	< 27%	36-97%	≥ 28%	축	2,4-Dinitrotoluene	28-89%	< 47%	24-96%	× 38%
٦	N-Nitroso-di-n-propylamine	41-126%	%8€ ⋝	41-116%	≥ 38%	Ë	Pentachlorophenoi	17-109%	< 47%	9-103%	> 50%
æ	1,2,4-Trichlorobenzene	38-107%	%€Z ⋝	39-98%	≥ 28%	77	Pyrene	35-142%	< 36%	26-127%	< 31%
>	4-Chloro-3-methylphenol	26-103%	%€€ >	23-97%	≥ 42%						

LDC #: 183347 SDG #: ___

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

| N | N/A | Was a LCS required?
| N | N/A | Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

																	T	Ī							=
Qualifications	NO QAAT	7																							
Associated Samples	All water +	10																							
RPD (Limits)	()	()	())	()	()	()))	()	()))	((()	()	()	()	()	()	()	())	
LCSD %R (Limits)	()	()	(()	()	()	()	()	()	())	()	()	()	()	()		()	()	()	())	-)	
LCS %R (Limits)	(16-0E) SC	_	()	()	()	()	. (()	()	()	()	()	()	(()	()	()	()	()	()	(()	()	
Compound	HH																								
TCS/TCSD ID	527- 5526208																								
Date																									
*									ᅦ		1		\dashv	1	1			1	1	7					

LDC # 1825 A. SDG # SDG #: AND SDG #:

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

 $RRF = (A_{\star})(C_{\star \star})/(A_{\star \star})(C_{\star \star})$ average RRF = sum of the RRFs/number of standards %RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

 $A_{\rm b}$ = Area of associated internal standard $C_{\rm b}$ = Concentration of internal standard X = Mean of the RRFs

				Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	RRF (50 std)	RRF (写ひ std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD
	1451	10/01	Phenol (1st internal standard)	2. 66 254	2.66x4	2.6974	2-6974)	6.253.49	6.25349
\dashv			Naphthalene (2nd internal standard)	1.10277	1.10277	1.09527	1.0952	19 39092	
			Fluorene (3rd internal standard)	1.36978	1.36978	1.34878	XLBh E.1	14.54450	ashbs-h1
\neg			Pentachlorophenol (4th internal standard)	0. 15002	0.15602	05.120	25051:0	11.54795	11:24195
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.8769	6928.0	254180	0.81452	7.06979	Ľ
\dashv			Benzo(a)pwrene (6th internal standard)	1.2127	1.21257	1.18939	1.18939	3.60%	3.602 B
2			Phenoi (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
ᅦ			Benzo(a)pyrene (6th internal standard).						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC# 14350A7 SDG #: su cover

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page:___ 2nd Reviewer:_ Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

ave. RRF = initial calibration average RRF RRF = continuing calibration RRF Where:

 $A_{\rm is}$ = Area of associated internal standard $C_{\rm is}$ = Concentration of internal standard

% Difference = 100 * (ave. RRF - RRF)/ave. RRF RRF = $(A_{\lambda})(C_{s})/(A_{s})(C_{\chi})$

A_x = Area of compound, C_x = Concentration of compound,

					Reported	Recalculated	Reported	Recalculated
#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	RRF (CC)	RRF (CC)	0%	σ%
-	4CAL4379	2 7 08	Phenol (1st internal standard)	2.69741	2.62250	2.6225	2.17.2	721112
		-	Naphthalene (2nd internal standard)	1.09527	1.10100	00101.1	0. 5233)	0.5133)
			Fluorene (3rd internal standard)	1.34818	1.34358	1. 34358	0.3863	0.383
			Pentachlorophenol (4th internal standard)	o.150s	0.1823	0.1923/	568 81 12	21.13833
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.81450	205 61.0	2026-0	365.2	348-2
			Benzo(a)pyrene (6th internal standard)	1.14939	1.21353	1.21253	2.02920	2.02gw
7			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
٣			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. LDC#: 18356A2 SDG #: see coner

VALIDATION FINDINGS WORKSHEET Surrogate Results Verification

Page:_	/_0t/
Reviewer:	Fi
2nd reviewer:	1

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found SS = Surrogate Spiked

Sample ID:

Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
570	34.0522	68	68	0
	35.5669	71	71	
	44.6857	89	89	
75	50.2596	67	67	
1	46.948	63	63	
	54.1342	72	72	
	Spiked 570	Spiked Found 50 34.0522 35.5669 44.6857 75 50.2696 44.9408	Surrogate Surrogate Recovery Reported	Surrogate Surrogate Recovery Recovery Recalculated

2-Chlorophenol-d4 1,2-Dichlorobenzene-d4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14	·				
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 18 250 AV SDG #: per court

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Page: of/ 2nd Reviewer: Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

SSC = Spiked sample concentration SA = Spike added Where:

SC = Sample concentation

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: __

カナトグ

	S	pike	Sample	Spiked Sample	ample	Matrix	Matrix Spike	Matrix Spike Duplicate	- Duplicate	MS/MSD	sn
Compound	Add (ng)	Added	Concentration	Concentration ()	vation	Percent Recovery	Recovery	Percent Recovery	ecovery	RPD	
	O SM	MSD	D	MS	O Msp	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3560	3530		2390	2480	67	67	70	70	3.5	35
N-Nitroso-di-n-propylamine	-			25.80	2720	12	12	12	11	4.5	S.4
4-Chloro-3-methylphenol				2592	2740	74	41	8L	78	3.6	ņ
Acenaphthene				2460	2510	69	69	=	7	8.1	1.8
Pentachlorophenol				2640	2460	74	74	10	10	O.F	2.0
Pyrene		->		2610	2700	74	74	17	17	3.4	4·E

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC#: 18 350A7 SDG #: per coner

VALIDATION FINDINGS WORKSHEET

Reviewer:_

2nd Reviewer. Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA

Where: SSC = Spike concentration SA = Spike added

RPD = 1 LCS - LCSD 1 * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

8031298 LCS/LCSD samples: _

_										ī .	_	 _
CS/I CSD	RPD	Recalculated			\							
I CS/I	R	Reported										
n.	ecovery	Recalc										
I CSD	Percent Recovery	Reported						7 47	\			
S	ecovery	Recalc	657	10	73	69	28	2				
ICS	Percent Recovery	Reported	65	OL	13	69	08	22				
k	Concentration (MS)	I CSD	μĄ	_				>				
ďS	Concer	l CS	מאוב	2330	2420	2320	2650	2400				
ike ·	Added (Na Ka)	LCSD	ህ&	•				→				
ďs	Ad وبر)	SUI	3330					>				
	Compound		Phenol	N-Nitroso-di-n-propylamine	4-Chloro-3-methy/phenol	Acenaphthene	Pentachlorophenol	Pyrene				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_	183	550A2
		eoner

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	<u>/</u> of/_
Reviewer:_	
2nd reviewer:	1/

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Percent solids, applicable to soil and solid matrices only.

Υ	N	N/A
Ÿ	N	N/A

%S

Were all reported results recalculated and verified for all level IV samples?
Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Conce	ntration	$= \frac{(A_{x})(I_{x})(V_{t})(DF)(2.0)}{(A_{x})(RRF)(V_{0})(V_{t})(\%S)}$	Example:
A _x	=	Area of the characteristic ion (EICP) for the compound to be measured	Sample I.D
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard	
l _s	=	Amount of internal standard added in nanograms (ng)	Conc. = ()()()()()()()
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).	$\bigcap I_{A}$
V,	=	Volume of extract injected in microliters (ul)	= \(\lambda\)
V,	=	Volume of the concentrated extract in microliters (ul)	
Df	=	Dilution Factor.	

2.0	= Factor of 2 to accoun	t for GPC cléanup			
#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Qualification
				<u> </u>	
				~····	
					:
					-
				···	
İ					
			<u>'</u>		
j			1		1

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Chlorinated Pesticides



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Chlorinated Pesticides

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10'
TSB-HJ-09-0'
TSB-HJ-09-0'DL
TSB-HJ-09-0'RE
TSB-HJ-09-0'REDL
TSB-HJ-03-0'
TSB-HJ-03-0'
TSB-HJ-03-0'-FD
TSB-HJ-03-0'
TSB-HR-03-0'
TSB-HR-03-0'RE

TSB-HR-01-10' TSB-HJ-01-0' RINSATE-1 TSB-HJ-01-10'M

TSB-HJ-01-10'MS TSB-HJ-01-10'MSD TSB-HJ-09-0'MS TSB-HJ-09-0'MSD RINSATE-1MS RINSATE-1MSD

TSB-HJ-03-10
TSB-HR-03-0'
TSB-HR-03-0'RE
TSB-HR-03-10'**
TSB-HJ-02-0'**
TSB-HJ-02-10'**
TSB-HR-02-10'**
TSB-HR-02-10'**
TSB-HJ-11-0'**
TSB-HJ-11-10'
TSB-HJ-11-10'-FD

TSB-HR-01-0'

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 26 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
TSB-HJ-09-0'RE TSB-HJ-09-0'REDL TSB-HR-03-0'RE	All TCL compounds	19	14	J- (all detects) UJ (all non-detects)	А

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Retention time windows were evaluated and considered technically acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
2/11/08	KCAL735	RTX-CLP1	Toxaphene	26.5	TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'	J+ (all detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
2/11/08	KCAL735	RTX-CLP2	Toxaphene	23.6	TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'	J+ (all detects)	A
2/14/08	KCAL955	RTX-CLP2	Heptachlor	15.1	TSB-HJ-09-0'RE TSB-HR-03-0'RE TSB-HJ-09-0'MS TSB-HJ-09-0'MSD 8044048-BLK	J+ (all detects)	A
2/14/08	KCAL955	RTX-CLP2	4,4'-DDT	20.4	TSB-HJ-09-0'RE TSB-HJ-09-0'REDL TSB-HR-03-0'RE TSB-HJ-09-0'MS TSB-HJ-09-0'MSD 8044048-BLK	J+ (all detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
2/12/08	ICV	RTX-CLP1	Toxaphene	20.7	TSB-HJ-09-0'RE TSB-HR-03-0'RE TSB-HJ-09-0'MS TSB-HJ-09-0'MSD 8044048-BLK	J+ (all detects)	А
2/12/08	ICV	RTX-CLP2	Toxaphene	17.8	TSB-HJ-09-0'RE TSB-HR-03-0'RE TSB-HJ-09-0'MS TSB-HJ-09-0'MSD 8044048-BLK	J+ (all detects)	А

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

Sample "RINSATE-1" was identified as a rinsate. No chlorinated pesticide contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-HJ-01-10'	Not specified	Decachlorobiphenyl	118 (63-117)	All TCL compounds	J+ (all detects)	Р
TSB-HJ-09-0'	Not specified	Decachlorobiphenyl	127 (63-117)	All TCL compounds	J+ (all detects)	А
TSB-HJ-03-0'	Not specified	Decachlorobiphenyl	121 (63-117)	All TCL compounds	J+ (all detects)	Р
TSB-HJ-03-0'-FD	Not specified	Decachlorobiphenyl	118 (63-117)	All TCL compounds	J+ (all detects)	Р
TSB-HJ-03-10'	Not specified	Decachlorobiphenyl	131 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HR-03-0'	Not specified	Decachlorobiphenyl	120 (63-117)	All TCL compounds	J+ (all detects)	A
TSB-HR-03-10'**	RTX-CLP1	Decachlorobiphenyl	121 (63-117)	All TCL compounds	J+ (all detects)	Р
TSB-HR-02-0'**	RTX-CLP1	Decachlorobiphenyl	121 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HR-02-10'**	RTX-CLP1	Decachlorobiphenyl	123 (63-117)	All TCL compounds	J+ (all detects)	Р
TSB-HJ-11-0'**	RTX-CLP1	Decachlorobiphenyl	128 (63-117)	All TCL compounds	J+ (all detects)	Р
TSB-HJ-11-10'	Not specified	Decachlorobiphenyl Tetrachloro-m-xylene	126 (63-117) 120 (55-115)	All TCL compounds	J+ (all detects)	Р
TSB-HJ-11-10'-FD	Not specified	Decachlorobiphenyl Tetrachloro-m-xylene	123 (63-117) 118 (55-115)	All TCL compounds	J+ (all detects)	P
TSB-HR-01-0'	Not specified	Decachlorobiphenyl Tetrachloro-m-xylene	134 (63-117) 120 (55-115)	All TCL compounds	J+ (all detects)	Р
TSB-HR-01-10'	Not specified	Decachlorobiphenyl	122 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HJ-01-0'	Not specified	Decachlorobiphenyl	122 (63-117)	All TCL compounds	J+ (all detects)	Р
8034041-BLK	Not specified	Decachlorobiphenyl	130 (63-117)	All TCL compounds	J+ (all detects)	Р

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MS and MSD percent recoveries (%R) were not within QC limits for some compounds, LCS percent recovery (%R) was within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recovery (%R) was not within QC limits for one compound, the MS/MSD percent recoveries (%R) and relative percent differences (RPD) were within QC limits and no data were qualified.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-HJ-09-0' TSB-HJ-09-0'RE	4,4'-DDE 4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	Α

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples.

BRC Tronox Parcel H Chlorinated Pesticides - Data Qualification Summary - SDG F8A260143

				<u> </u>	
SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	TSB-HJ-09-0'RE TSB-HJ-09-0'REDL TSB-HR-03-0'RE	All TCL compounds	J- (all detects) UJ (all non-detects)	Α	Technical holding times
F8A260143	TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'	Toxaphene	J+ (all detects)	Α	Continuing calibration (%D)
F8A260143	TSB-HJ-09-0'RE TSB-HR-03-0'RE	Heptachlor	J+ (all detects)	A	Continuing calibration (%D)
F8A260143	TSB-HJ-09-0'RE TSB-HJ-09-0'REDL TSB-HR-03-0'RE	4,4'-DDT	J+ (all detects)	А	Continuing calibration (%D)
F8A260143	TSB-HJ-09-0'RE TSB-HR-03-0'RE	Toxaphene	J+ (all detects)	А	Continuing calibration (ICV %D)
F8A260143	TSB-HJ-09-0' TSB-HR-03-0'	All TCL compounds	J+ (all detects)	Α	Surrogate spikes (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-10'** TSB-HR-02-0'** TSB-HR-11-10'** TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-0' TSB-HJ-01-0'	All TCL compounds	J+ (all detects)	Р	Surrogate spikes (%R)
F8A260143	TSB-HJ-09-0' TSB-HJ-09-0'RE	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	Α	Compound quantitation and CRQLs

BRC Tronox Parcel H Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG F8A260143

No Sample Data Qualified in this SDG

LDC #: 18356A3a	VALIDATION COMPLETENESS WORKSHEET	Date: <u>3/4/08</u>
SDG #: F8A260143	Level III/IV	Page: <u>/</u> of <u>/</u>
Laboratory: Test America		Reviewer: 🦰
		2nd Reviewer:

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 1/x/ox
11.	GC/ECD Instrument Performance Check	A	, ,
III.	Initial calibration	Δ	
IV.	Continuing calibration/ICV	SW	100 = 15
V.	Blanks	Δ	
VI.	Surrogate spikes	<i>۱۷۷</i> ی	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	હω	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	Δ	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level III validation.
XIII.	Overall assessment of data	4	
XIV.	Field duplicates	ND	D= 7,8 18,19 R=23
XV.	Field blanks	NO	R=23

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples: **, Indicates sample underwent Level IV validation

	Goil + water	<u> </u>					
1 1	TSB-HJ-01-10'	11 %	TSB-HR-03-0'RE	21	TSB-HR-01-10'	31]	8034041-BIK
2 1	TSB-HJ-09-0'	12	TSB-HR-03-10'**	22 \	TSB-HJ-01-0'	32 ²	8044048-BK
3 1	3, の TSB-HJ-09-0'DL	13	TSB-HJ-02-0'**	23 3	RINSATE-1 ₩	33 2	8079304-BUK
4 2	TSB-HJ-09-0'RE	14	TSB-HJ-02-10'**	24	TSB-HJ-01-10'MS	34	
₅ ν	TSB-HJ-09-0'REDL	15 \	TSB-HR-02-0'**	25]	TSB-HJ-01-10'MSD	35	
6	TSB-HJ-09-10'	16 1	TSB-HR-02-10'**	₂₆ 2	TSB-HJ-09-0'MS	36	
7 I	TSB-HJ-03-0' 📝	17	TSB-HJ-11-0'**	27 2	TSB-HJ-09-0'MSD	37	
8 1	TSB-HJ-03-0'-FD ♀	18)	TSB-HJ-11-10'	28 3	RINSATE-1MS W	38	
9 1	TSB-HJ-03-10'	19	TSB-HJ-11-10'-FD D	29 3	RINSATE-1MSD W	39	
10	TSB-HR-03-0'	20	TSB-HR-01-0'	30		40	

LDC #: 18356A3a VALIDATION FINDINGS CHECKLIST SDG #: su comes

Page: /of 2 Reviewer: F7 2nd Reviewer: ___(____

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
l. Technical holding times				
All technical holding times were met.		/		
Cooler temperature criteria was met.	_			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?				
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) \leq 20%?	_			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		_		
Did the initial calibration meet the curve fit acceptance criteria?				
Were the RT windows properly established?	_	-		
Were the required standard concentrations analyzed in the initial calibration?	_			
W. Continuing calibration				
What type of continuing calibration calculation was performed?%D or%R	_			
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	_			
Were endrin and 4,4'-DDT breakdowns \leq 15%.0 for individual breakdown in the Evaluation mix standards?				
Was a continuing calibration analyzed daily?				
Were all percent differences (%D) ≤ 15%.0 or percent recovieries 85-115%?		_		
Were all the retention times within the acceptance windows?				
V. Błanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Were extract cleanup blanks analyzed with every batch requiring clean-up?				
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?				
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				

LDC #: 18356 A3a SDG #: pu cones

VALIDATION FINDINGS CHECKLIST

	Page:_	a _{of}	2
	Reviewer:	عر	
2nd	Reviewer:	V	

Validation Area	Yes	No	NA	Findings/Comments
VII. Metrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	_			
Was a MS/MSD analyzed every 20 samples of each matrix?	_			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				-
X. Target compound identification				
Were the retention times of reported detects within the RT windows?				
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?		-		
XII. System performance				
System performance was found to be acceptable.	1			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.				
XIV: Field duplicates				
Field duplicate pairs were identified in this SDG.			İ	
Target compounds were detected in the field duplicates.				
XV. Field:blanks				
Field blanks were identified in this SDG.	T	-		
Farget compounds were detected in the field blanks.				

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha.RHC					
		I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	
B. heta-RHC					.00
		J. 4,4'-DDE	R. Endrin aldehyde	7 Arochae 1948	
21/25				1. 7. 000 1. 7.40	##.
C. della-BHC		K. Endrin	S. alpha-Chlordane	AA Aroclor-1984	
Oud cames O				1071-1010	
Samma-DUC	3	L. Endosulfan il	T. gamma-Chlordane	BB. Arnelor-4980	
F Hontachion				207	
		M. 4,4*-DDD	U. Toxaphene	CC. DB 608	
F. Aldrin					KK.
	-	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	
G. Hentachlor engulde	photoldo				
	anivoda.	O. 4,4'-DDT	W. Aroclor-1221	EE.	
H. Endosulfan I					WW.
		r. Methoxychlor	X. Aroclor-1232	FF.	
				•	

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Notes:

LDC #: 18356 /134 SDG#: ALL

VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page: ___of__ Reviewer:__ 2nd Reviewer:_

3	300 #. 44 COVEN			<u>=</u>	lecunical Holding Times	TIES		Reviewer:
₹≻િ	All bircled dates have exceeded the technical holding times.	e exceeded th cooler temper	re technical ho	Iding times. /alidation criteria?				2nd Reviewer:
) /	METHOD: GC	35 H	HPLC					
	Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
	J	Soil	04	1/2/08	30 612	30/11/2	61	1-/41/A NO+DET
					-	-		
	12 V	-		-			9	1
	Φ	*	>	>	-3	a0/s1/+	5	1 /W 1//3 De T
		7	7	>	7	^	->	J-/WJ/ ND
					•			
		·						
						-		
			·					
•								

TECHNICAL HOLDING TIME CRITERIA VOLATILES: Water unpreserved: A

Aromatic within 7 days, non-aromatic within 14 days of sample collection. Both within 14 days of sample collection. Both within 14 days of sample collection. Water unpreserved: Water preserved: Soils:

Water: Soil:

Extracted within 7 days, analyzed within 40 days. Extracted within 14 days, analyzed within 40 days.

LDC# (8358A3A es cove SDG #:

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: /of / Reviewer:

2nd Reviewer:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

HPLC

ا ور

METHOD:

What type of continuing calibration calculation was performed? ____%D or ___ RPD
Y M_ KNA _____ Were continuing calibration standards analyzed at the required frequencies?
Y N_ M/A ______ Did the continuing calibration standards meet the %D / RPD validation criteria of <15.0%?

Y/N M/A Level IV Only Y M N/A

Were the retention times for all calibrated compounds within their respective acceptance windows?

	NV						ND+ Det	7		۲												
fications		-					-dN			- Det												
Quali	1+/4wt N	7					1+/Add			1+/Adut		1+/A dut	Λ	•								
Associated Samples		· →					8 OH4048 - B1K,	4, % , 11, 26,27		2		804 to #8 - BLK,	1 11. J 26.27	-								
	(()	()	(^	(((((((((~	((((_
RT (limit))	
))))))))))))))))))		
%D / RPD (Limit ≤ 15.0)	26.5	23.6					1.51	20.4		20. H		1.02	17.8									
Compound	۲	٨					臣	þ		Ø		5	4									
Detector/ Column	RTX-CLP1	RTX-CUP 2	-				RTX-enp2			A A		RTX-CLF1	8TX-CNP2	-								
Standard ID	keA1735						KG L955			^		101										
Date	2/11/08						2/14/08	-		ラ		2/12/08	-									
#	+						+	+				+	+									

LDC#: 18350 A3-SDG#: 16 Conn

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page:

Reviewer: 2nd Reviewer:

METHOD: GC HPLC
Are surrogates required by the method? Yes or No_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were surrogates spiked into all samples and blanks?

Did all surrogate recoveries (%R) meet the QC limits?

> #	Sample ID	ဦ ပိ	Detector/ Column		Surrogate Compound		%R (Limits)				Oualifications	ations
	<i>i</i>	, fou	Spic	Doil	θ)	50	(/// -	14/Pdet		φn
			, 0							•		
	2		1		7		/27	2		J/A 40	ď	NO+Det
						_						
	3,5		1		9		00	63-117		30 00	10 XOL VALO	70
					χ		OO	1-35	1			
	\$		+7									
			-		φ) 2	63-117	. 177	1+1/P dat	1	ND
)		^			
	8		→		À) \$11	 ->		 	12	
	×											
	0		-}		ዯ		131	ゔ		77	2	<u> </u>
						_)					
	al		\rightarrow		>	$\left \cdot \right $	21	~		W/15	A det	ND + DET
)					
	7	RTX.	RTX-CNP		4	\vdash	121	7	(1+1	Polet	ND
						\dashv						
	^				~	_	121	7	^	→		ND
	اد				7		123	7	(<i>></i>		ďΛ
)		(
	Surrogate Compound			Surroga	Surrogate Compound		Surrogate Compound		Surrogate	Surrogate Compound		
٩	Chlorobenzene (CBZ)	ပ		Octa	Octacosane	Σ	Benzo(e)Pyrene	S	1-Chloro-3-	1-Chloro-3-Nitrobenzene	, ,	Tetrachloro-m- xylene
Ф	4-Bromofluorobenzene (BFB)	I		Ortho	Ortho-Terphenyl	z	Terphenyl-D14	_	3,4-Dinit	3,4-Dinitrotoluene		
U	a,a,a-Trifluorotoluene		-	Fluorob	Fluorobenzene (FBZ)	0	Decachlorobiphenyl (DCB)	n	Tripe	Tripentyltin		
٩	Bromochlorobenene	1	\dashv	D-T	n-Triacontane	а	1-methylnaphthalene	^	Trl-n-p	Trl-n-propyltin		
w w	1,4-Dichlorobutane	¥	-	Пе	Нехасоѕапе	σ	Dichlorophenyl Acetic Acid (DCAA)	3	Tributyl F	Tributyl Phosphate		
	1.4-Difluorobenzene (DFB)	1	-	Bron	Bromobenzene	ĸ	4-Nitrophenol	×	Triphenyl	Triphenyl Phosphate		

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Reviewer: Page:

2878881

LDC #:

SDG #: 1

METHOD: ___GC___HPLC
Are surrogates required by the method? Yes___ or No__

Prease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N/A

Were surrogates spiked into all samples and blanks?
Did all surrogate recoveries (%R) meet the QC limits?

	Triphenyl Phosphate	Tripheny	×	4-Nitrophenol	B	Bromobenzene	йĀ	-	1	I. 1.4-Uilluorobenzene (UFB)	
	Tributyl Phosphate	$\frac{1}{1}$	≩	Dichlorophenyl Acetic Acid (DCAA)	О	Hexacosane	1	-	¥	1,4-Dichlorobutane	<u>.,</u>
	Tri-n-propyltin	o-u-iu-	>	1-methylnaphthalene	۵	n-Triacontane	ď	-	7	Bromochlorobenene	ام
	Tripentyltin	Tripe	⊃	Decachlorobiphenyl (DCB)	0	Fluorobenzene (FBZ)	Fluor	+	1	a,a,a-Trifluorotoluene	O
	3,4-Dinitrotoluene	3,4-Dinit	-	Terphenyl-D14	z	Ortho-Terphenyl	δ	+	I	4-Bromofluorobenzene (BFB)	В
Tetrachloro-m- xylene	1-Chloro-3-Nitrobenzene		S	Benzo(e)Pyrene	Σ	Octacosane		\dashv	ပ	Chlorobenzene (CBZ)	∢
	Surrogate Compound	Surrogate	Щ	Surrogate Compound		Surrogate Compound	Surrog		-	Surrogate Compound	
)									
12	77 451	, , , , , , , , , , , , , , , , , , ,									
(1/1/	14 17 det			130		P	-	\		8034041-BIR	
MD	J. 17 oct	1		122 (ф		*		23	
QN	1+1P4t	63-117	7	1.2 d		٥		1		8	
)							
	7			730		<i>*</i>		_			
CIN	top d/ +1) 784		_				೩೦	
		, A		118		>					
ND	11/P det	(/) 52/				*		61	
7	f	- 115	55) OEI		>			1		
Qπ	J+/P det	/		727		1	10	31441 jc	i . II	18 100	
det ND	7/1	63-11/	9) YY/		0		3	1 A		
Qualifications				%R (Limits)		Compound		Column	ပ	₽ 1	*
						Surrogate		Detector/	۵	Sample) :

LDC# (8350434 SDG#: Au count

VALIDATION FINDINGS WORKSHEET

Page: /of/

2nd Reviewer: Reviewer:

Matrix Spike/Matrix Spike Duplicates

ြင္သ METHOD:

X N X

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

						,,												=				-			- -1
Qualifications	To or																								
Associated Samples	54-6	ħ																							
RPD (Limits)	(()	()	()	()		()	()	()	()	()	()	()	()	()	()	()		()	()	()	()	()	()	
MSD %R (Limits)		47 (57-125)		()	()		(()	()	()	()	(()	()	()	(.)	()	()	()	()	()	()	()	()	
MS %R (Limits)	328 (52-140	143 (57-125		()	()	()	()	()	()	()	()		()	()	()	()	()	()	()	()	()	()	()	()	
Compound	Э	7																							
MS/MSD ID	26+27																								
) #																									

LDC # 18 350 A34 338 SDG#:

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Page: Reviewer:_ 2nd Reviewer:

METHOD: _GC _ HPLC

 $\hat{P}l\hat{e}_{\beta}$ se see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y/N/N/A

Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only
Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

S																								
Qualifications	no out																							
Associated Samples	大日 - 1 hのhをのあ	1-3, 6-710, 12-722	T																					
RPD (Limits)	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	(
LCSD %R (Limits)	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	.)	()	()	()	()	()	()	
LCS %R (Limits)	133 (59-123	()	()	()	()	()	())	()	()	()	()	()	()	()	()		()	()	()	()	()	()	()
Compound	d																							
CS/CSD ID	8034041-108																							
*																								

18356430 SDG #: LDC #:

Compound Quantitation and Reported CRQLs VALIDATION FINDINGS WORKSHEET

Page: Reviewer: __ 2nd Reviewer:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". evel IV/D Only

GC HPLC

METHOD:

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.? Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Y Z Z Z Z

Qualifications	1/A dt								
Associated Samples	7. 4								
Finding	exceeded cal pange								
Compound Name	7,0							٠	
#									

Comments: See sample calculation verification worksheet for recalculations

18356 ABA SDG #: 12 cont LDC #:

Initial Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

2nd Reviewer: Reviewer: Page:

> HPLO METHOD: GC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C average CF = sum of the CF/number of standards %RSD = 100 * (S/X)

A = Area of compound, C = Concentration of compound, S = Standard deviation of the CF X = Mean of the CFs

				Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
#	Standard ID	Calibration Date	PunoduoO	CF (0.00%td)	CF (O.O'Std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD
-	1451	80/L/e	endusulpan 1 ATKUP	264234520	20 yestero	PTX UP 104234520 26 42550 0505420 14505470	014650594	5.825:5	5.535
				53596400	53596400 52596400	06445E 55	SS 3344 R	4.736	4.736
2			1. ATKENPI	14Q5HL & 9S	phashlags d	461.9 OYESYELFS CF2 346346 GHORT & OS	J 57238340	6.294	b.234
			>	169KS 07E	O MONGY	140 34 345 DING 345 CHANGE ONS ONS OFFE	phschsk i	622-7	(86.9
9							•		
									
4									
	.								

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG#: ALL LDC #:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: 2nd Reviewer. Reviewer:

> HPLC METHOD: GC_

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF CF = A/C

ave. CF = initial calibration average CF CF = conthuing calibration CF A = Area of compound C = Concentration of compound Where:

CF/Conc. %D O.0245 O.0257 O.0257 O.0257 O.0257 3.7						Reported	Recalculated	Reported	Recalculated
KGALTIT 2/10/08	*	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	CF/Conc. CCV	CF/Conc. CCV	Q%	α %
1	1 1	KCA L717	2/10/08	endosulpan Plx-cup!	0.0250	0.0245	o.oms	1.7	7.7
\$\frac{1}{4}\$ \$\frac{1}{4}\$<			•	methosylchlor	→	1320.0	6.0x7	2.2	2-6
3.7				RTX-CLP2		0,0200	0.046	h·9	4.4
3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	2			Ŋ	- ^	6520.0	0.000	5.7	3-7
									,
4									
	8						,		
4									
	4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. SDG #: pu coner

LDC #: 18356A3 VALIDATION FINDINGS WORKSHEET **Surrogate Results Verification**

Page:	/_of/
Reviewer:	\overline{D}
2nd reviewer:	1

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R)	of surrogates were	recalculated for the com	pounds identified belo	ow using	the following	calculation:
-----------------------------	--------------------	--------------------------	------------------------	----------	---------------	--------------

% Recovery: SF/SS * 100

Where: SF = Surrogate Found

SS = Surrogate Spiked

Sample ID: 12

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	ptxcrP]	0.020	0.024	120	120	0
Decachlorobiphenyl	V	· V	0.024	121	(2)	D
Decachlorobiphenyl						

Sample ID:_____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:_

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						,
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl		7-771				

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachioro-m-xylene						
Tetrachioro-m-xylene						
Decachlorobiphenyl			<u> </u>			
Decachlorobiphenyl						W. W

Notes:		

18 256A30 SDG#:_ LDC #:

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Page: / of / Reviewer: 2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration SA = Spike added

SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples:

	<u>~</u> ∀ ∾	Spike Added	Sample		Spiked Sample	Matri	Matrix Spike	Matrix Spi	Matrix Spike Duplicate	W	MS/MSD
Compound) N	2 4	(mg/ f2)		X (5)	Percent	Percent Recovery	Percent	Percent Recovery		RPD
	MS	MSD))	MS	/ WSD	Reported	Recalc.	Reported	Recalc.	Renorted	Receivilated
gamma-BHC	17.3	17.6	ДN	16.9	5.0	97	97	2	(/&	Č.	C O
4,4'-DDT	->	17.6	7	18.6	17.0	107	107		2 6	- 2	- 6
		•				,			,		/./

Comments: Refer ot Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0%

LDC#. 18356A34 SDG #: per const

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page:

Reviewer:_ 2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration SA = Spike added

SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

8034041 - 165 LCS/LCSD samples:

	<i>5</i> 0	pike	Spikec	l Sample	<u>.</u>	CCS	ГС	TCSD	SOT	rcs/rcsd
Compound	3	المحراكين	Conc.	Concentration (ug/ K)	Percent	Percent Recovery	Percent	Percent Recovery	H	RPD
	CS	LCSD	SOT	C _{LCSD}	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	از ۲	NΔ	15.5	ΥĄ	93	93				
4,4'-DDT	1.9.7	7	6.71	->,	<u> </u>	رو <i>ر</i>	¥7			

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:_	18	356	A3~
SDG #:_			

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	/of_/
Reviewer:	P
2nd reviewer:	

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Υ	N	/N/A
Y	N	N/A/

Were all reported results recalculated and verified for all level IV samples?

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

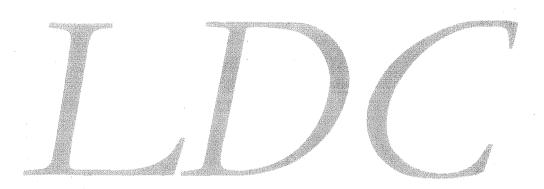
Example:	
Sample I.D.	:
Conc. = (
=	
NI)

#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Qualification	

C:\WPDOCS\WRK\PEST\RECALC	30

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Polychlorinated Biphenyls



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Polychlorinated Biphenyls

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10'
TSB-HJ-09-0'
TSB-HJ-09-10'
TSB-HJ-03-0'
TSB-HJ-03-10'
TSB-HR-03-0'
TSB-HR-03-10'**

TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HR-02-0'**

TSB-HR-02-10'**

TSB-HJ-11-0'**

TSB-HJ-11-10'

TSB-HJ-11-10'-FD

TSB-HR-01-0'

TSB-HR-01-10'

TSB-HJ-01-0'

RINSATE-1

TSB-HJ-02-10'MS

TSB-HJ-02-10'MSD TSB-HJ-01-0'MS TSB-HJ-01-0'MSD RINSATE-1MS RINSATE-1MSD

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Retention time windows were evaluated and considered technically acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
2/4/08	PCAL541	RTX-CLP1	Aroclor-1016	16.8	TSB-HR-01-10' TSB-HJ-01-0' TSB-HJ-01-0'MS TSB-HJ-01-0'MSD	Aroclor-1016 Aroclor-1221 Aroclor-1232	J+ (all detects) J+ (all detects) J+ (all detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

Sample RINSATE-1 was identified as a rinsate. No polychlorinated biphenyl contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples.

BRC Tronox Parcel H Polychlorinated Biphenyls - Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	TSB-HR-01-10' TSB-HJ-01-0'	Aroclor-1016 Aroclor-1221 Aroclor-1232	J+ (all detects) J+ (all detects) J+ (all detects)	А	Continuing calibration (%D)

BRC Tronox Parcel H
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

SDG # Labora METH The sa	atory: Test America OD: GC Polychlorinated amples listed below were	_ — Biph	enyls (EPA	Le SW 846 N	evel III/I\ Method 80	982)			Date:_ Page: <u>/</u> Reviewer:_ 2nd Reviewer: _. dings are noted in a	3/3/ _of/_
validat	ion findings worksheets.	A	, , , , , , , , , , , , , , , , , , , 	<u> </u>	<u> </u>		C			
	<u>Validation</u>	Area						mments ⊙0		
<u>l.</u>	Technical holding times			A NA	Sampling of	dates:	125	00		
11.	GC/ECD Instrument Perforn	nance	Check	NA						
111.	Initial calibration			<u>A</u>						
IV.	Continuing calibration/ICV			SW	101	SK				
V.	Blanks			<u> </u>						
VI.	Surrogate spikes			<u> </u>						
VII.	Matrix spike/Matrix spike du	olicate	s	<u> </u>						
VIII.	Laboratory control samples			A	LC?	>				
IX.	Regional quality assurance	and qu	ality control	N						
Xa.	Florisil cartridge check			N						
Xb.	GPC Calibration			N						
XI.	Target compound identificat	ion		4	Not review	ved for Level III v	alidation.			
XII.	Compound quantitation and	report	ed CRQLs	A	Not review	ved for Level III v	alidation.			
XIII.	Overall assessment of data			4						
XIV.	Field duplicates			NO	D = 1	4.5		14 + 1	5	
XV.	Field blanks			ND	R = 1	9				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ad Samples: ** Indicates sam	ole und	R = Rin FB = Fi	o compound sate eld blank	s detected	D = Dup TB = Tri EB = Eq		blank		
1	TSB-HJ-01-10'	11	TSB-HR-02-0)***	21	TSB-HJ-02-10'N	MSD.	31 \	8031454	2/4
		12	TSB-HR-02-1		22	TSB-HJ-01-0'M		32 7	8029346	1/3
	TSB-HJ-09-0'		TSB-HJ-11-0		23	TSB-HJ-01-0'M		33		-1/2
3	TSB-HJ-09-10'	13	130-11-0		23	1 20-1 10-0 1-0 101	55	133		

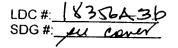
	soil twal	18						
1	TSB-HJ-01-10'	11	TSB-HR-02-0'**	21	TSB-HJ-02-10'MSD	31	8031454	2/4
2	TSB-HJ-09-0'	12	TSB-HR-02-10'**	22	TSB-HJ-01-0'MS	32 7	8029346	1/3
3	TSB-HJ-09-10'	13	TSB-HJ-11-0'**	23	TSB-HJ-01-0'MSD	33		,
4	TSB-HJ-03-0'	14	TSB-HJ-11-10' 🕡	24	RINSATE-1MS W	34		
5	TSB-HJ-03-0'-FD ()	15	TSB-HJ-11-10'-FD ?	25	RINSATE-1MSD W	35		
6	TSB-HJ-03-10'	16	TSB-HR-01-0'	26		36		
7	TSB-HR-03-0'	17	TSB-HR-01-10'	27		37		
8	TSB-HR-03-10'**	18_	TSB-HJ-01-0'	28		38		
9	TSB-HJ-02-0'**	197	RINSATE-1	29		39		
10	TSB-HJ-02-10'**	20	TSB-HJ-02-10'MS	30		40		

LDC #: 18 356A3b SDG #: peu coner

VALIDATION FINDINGS CHECKLIST

Page:__/of__1
Reviewer:______7
2nd Reviewer:______

Validation Area	Ye	s No	N/	A Findings/Comments
1. Technical holding times				
All technical holding times were met.				
Cooler temperature criteria was met.				
II. Initial calibration:				
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?		1_		<u> </u>
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		_	1	
Did the initial calibration meet the curve fit acceptance criteria?	1		1	+
Were the RT windows properly established?]	1		
IV-Continuing calibration				
What type of continuing calibration calculation was performed?%D or%R	_	<u> </u>		
Was a continuing calibration analyzed daily?		<u>L</u>	\mathbb{L}	
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?		<u> </u>	L	
Were all the retention times within the acceptance windows?		<u>Ł</u>		
V.Blanks				The contract of the contract o
Was a method blank associated with every sample in this SDG?		<u> </u>	<u></u>	
Was a method blank analyzed for each matrix and concentration?		上	<u></u>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		0	1	
И Surrogate spikes:				
Nere all surrogate %R within the QC limits?				
f the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			_	2.354
f any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
II. Maihx spike/Matrix spike duplicates				
Vere a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each natrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Vas a MS/MSD analyzed every 20 samples of each matrix?		-		
Were the MS/MSD percent recoveries (%R) and the relative percent differences RPD) within the QC limits?		_		
III. Laboratory control samples				
las an LCS analyzed for this SDG?				
/as an LCS analyzed per extraction batch?				
/ere the LCS percent recoveries (%R) and relative percent difference (RPD) ithin the QC limits?				



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 9 2nd Reviewer:

			_	
Validation Area	Yes	No	NA	Findings/Comments
IX Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				
X: Target compound adentification				
Were the retention times of reported detects within the RT windows?				
XI Compound quantitation/CROLs			Bara de	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
XI System performance 主,是是一个大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大				
System performance was found to be acceptable.				
XIII Overallassessment of data				
Overall assessment of data was found to be acceptable.				
XIV Field duplicates			g.	
Field duplicate pairs were identified in this SDG.				
Target compounds were detected in the field duplicates.				
XV. Field blanks				1
Field blanks were identified in this SDG.			Ī	
Target compounds were detected in the field blanks.			\top	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha.BHC				
	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	
B. beta-BHC				
	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	
C110 -1 ch C				ï
	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	
D. damma-BHC				
	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	* -
E. Heptachlor				
	M. 4,4-DDD	U. Toxaphene	CC. DB 608	XX
F. Aldrin				
	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701) [
G. Heptachlor epoxide				i
	0.44-001	W. Aroclor-1221	EE.	22
H. Endosulfan I				
e e e e e e e e e e e e e e e e e e e	r. methoxychlor	X. Aroclor-1232	FF.	NA

C:\docs\Work\Pesticides\COMPLST-3S.wpd

Notes:

LDC#: 1835643b SDG#: Les coves

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: Reviewer:_

2nd Reviewer:

/of /

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". GC HPLC METHOD:

Did the continuing calibration standards meet the %D / RPD validation criteria of <15.0%?

Were the retention times for all calibrated compounds within their respective acceptance windows? Y N N/A Level IV Only Y/N N/A

	_			 																	
Qualifications	IT/A GUT NID	and Y, W, X																			
Associated Samples	17, 18, 27, 23																				
RT (limit)) ((((()	()	()	()	()	()	()	()	((()	()	()	()	()	()	()
))																			
%D / RPD (Limit ≤ 15.0)	16.8													:							
Compound	/																				
Detector/ Column	RTX CLP 1																				
	PCAL SY									-											
Date																					
#:	4																				

18356A3b Carr SDG#: LDC #:

Initial Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

Page: Reviewer. 2nd Reviewer:

> HPLC METHOD: GC_

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following

CF = A/C average CF = sum of the CF/number of standards %RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X ≈ Mean of the CFs

			Reported	Recalculated	Reported	Recalculated	Denoted	
# Standard ID	Calibration Date	Compound	(Sector)	CF (570 Cstd)	Average CF (initial)	Average CF (initial)	Cod%	vecalcinated 4
- A 	100	1200-1 RTX-ONP	12182	12182	1,502	70511	9,60	9.589
T							2	
	-							
7	10/2/6	V RTX-enpl	RTX-apr 11265	1125	11104	honi	8.199	8.79.8
								,
	-							
14) 14)	30 zo 1	RK-arp1	Insu.	mon	21742	2/1742	7.597	7,597
	·							,
7	80/2/1	TX COPL	24897	L6882	がの子	rianc	5.089	C.087
1								

Comments: Referto Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated

LDC # 18 25 6436 er cons SDG#:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:

> HPLC METHOD: GC_

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF CF = A/C

Where: ave. CF = initial calibration average CF CF = continuing calibration CF

A = Area of compound C = Concentration of compound

Average CF(Ical)/ Average CF(Ical)/ Average CF(Ical)/ CF/Conc. CCV Conc. CCV CCV CCV CCV CCV CCV CCV C

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the

LDC #: 18350A3D SDG #: 24 cons

METHOD: ___G@___ HPLC

VALIDATION FINDINGS WORKSHEET Surrogate Results Verification

Page: ___of ___ 2nd reviewer: Reviewer:

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found SS = Surrogate Spiked

S						
Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
970	PTX OLD	\mathcal{C}	19.950/2/100	(००)	Col	O
						-

	Surrogate Percent Percent Percent Found Recovery Recovery Difference	Reported Recalculated		
	Column/Detector			
Sample ID:	Surrogate			

Sample ID:			Camping			
Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
		-				

1835BA3B Sore SDG#: 40 LDC #:

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Page: Lof Z Reviewer: 2nd Reviewer:_

> HPLC METHOD:

The percentrecoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 the following calculation: %Recovery = 100 * (SSC - SC)/SA

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike

SC = Sample concentration

MSD = Matrix spike duplicate

20 + MS/MSD samples:

	Added	ָּטַ פ	Conc.	Spike	Spike Sample	Matrix	Matrix spike	Matrix Spik	Matrix Spike Duplicate	MS/MSD	ASD
Compound	6m)	\$\$	- NOV -		W Fr	Percent	Percent Recovery	Percent	Percent Recovery	RPD	Q
	MS	MSD	'i	MS	MSD	Reported	Recalc	Donottod	1		Ħ
Gasoline (8015)								navidav	Vecalic.	керопеа	Recalc.
Diesel (8015)											
Benzene (80218)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Arodor 1260	177	11.11		193	168	109	3	0		-	-
		24.4					5			7	2
	276 -										

LDC # 1825 A3D SDG #: La coner

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: of Reviewer:

GC HPLC METHOD:

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

SSC = Spiked concentration SA = Spike added Where

SC = Sample concentration

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100

175

SHIS 05

LCS/LCSD samples:__

LCS = Laboratory Control Sample percent recovery

LCSD = Laboratory Control Sample duplicate percent recovery

-	Spike	ي و	Sample	Spike Sample	ample	SOT	S	rcsd	0	rcs/rcsD	csD
Compound	(M.91	Zaz.	Less Fra	(MA)	Kay	Percent Recovery	ecovery	Percent Recovery	covery	RPD	۵
	LCS	TCSD	0	SOT	Lcsp	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											3
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
An clos (260	12	∢ 2	C	167	トタコ	001	001	42			
											,

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

18 356 A3D	Le cons
LDC #:	SDG#:

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

/ jo /	1	~/
Page:	Reviewer:	2nd Reviewer:

METHOD:

\ \	/V/A	₹/N	
٠	Z	z	Γ
	.		

Were all recalculated results for detected target compounds within 10% of the reported results? Were all reported results recalculated and verified for all level IV samples?

(A)(Fv)(Df)	(RF)(Vs or Ws)/%S/10
Concentration=	_

(\$)(%8/100)

Example:

Sample ID.

Area or height of the compound to be measured Final Volume of extract A= Area or height of t Fv= Final Volume of e Df= Dilution Factor

RF= Average response factor of the compound
In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Concentration =_

Compound Name

# Sample ID Compound Reported Recalculated Recults Concentrations oncentrations Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Con						
	#	Sample ID	Compound	Reported Concentrations	Recalculated Results Concentrations	Qualifications
	L			-		
ommante:						
	a du du o	nts.				

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Metals



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Metals

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10'
TSB-HJ-09-0'
TSB-HJ-09-10'
TSB-HJ-03-0'
TSB-HJ-03-10'
TSB-HR-03-0'
TSB-HR-03-10'**
TSB-HR-02-0'**

TSB-HR-02-0'** TSB-HR-02-10'** TSB-HJ-11-0'**

TSB-HJ-11-10'

TSB-HJ-11-10'-FD

TSB-HR-01-0' TSB-HR-01-10'

TSB-HJ-01-0'

RINSATE-1

TSB-HJ-02-10'MS

TSB-HJ-02-10'MSD TSB-HJ-01-0'MS TSB-HJ-01-0'MSD RINSATE-1MS RINSATE-1MSD

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Mercury, Nickel, Niobium, Palladium, Phosphorus, Platinum, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, and Zirconium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
2/5/08	CCV (20:28)	Silver	111.4 (90-110)	All water samples in SDG F8A260143	J+ (all detects)	P
2/5/08	CCV (21:53)	Silver Boron Niobium	112.6 (90-110) 112.3 (90-110) 111.8 (90-110)	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' RINSATE-1 RINSATE-1MS RINSATE-1MSD PBS PBW	J+ (all detects) J+ (all detects) J+ (all detects)	Р
2/6/08	CCV (00:29)	Silver	111.6 (90-110)	TSB-HJ-03-0' TSB-HJ-03-10' TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'** TSB-HR-02-0'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-01-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HJ-01-0' TSB-HJ-01-0' TSB-HJ-01-0' TSB-HJ-01-0'MS TSB-HJ-01-0'MSD TSB-HJ-01-0'MSD	J+ (all detects)	Р

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
2/6/08	CCV (1:47)	Silver	112.7 (90-110)	TSB-HR-02-0'** TSB-HR-02-10'** TSB-HJ-11-0'** TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-0' TSB-HJ-01-0' TSB-HJ-01-0'MS TSB-HJ-01-0'MSD	J+ (all detects)	Р
2/6/08	CCV (15:27)	Palladium	111.8 (90-110)	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' PBS	J+ (all detects)	Р
2/6/08	CCV (16:22)	Palladium	112.3 (90-110)	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HJ-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HJ-02-10'MS TSB-HJ-02-10'MSD PBS	J+ (all detects)	Р

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Antimony Cadmium Chromium Iron Sodium Tin Titanium Tungsten	0.27 ug/L 0.065 ug/L 2.3 ug/L 12.6 ug/L 6.6 ug/L 0.48 ug/L 1.3 ug/L 0.27 ug/L	All water samples in SDG F8A260143

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Antimony Cadmium Molybdenum Niobium Titanium Tungsten	0.2 ug/L 0.1 ug/L 0.2 ug/L 6.1 ug/L 1.2 ug/L 0.6 ug/L	All water samples in SDG F8A260143
PB (prep blank)	Barium Boron Chromium Molybdenum Niobium Phosphorus Potassium Sodium Thallium Tin Titanium Tungsten Uranium Zinc	0.059 mg/Kg 4.2 mg/Kg 0.20 mg/Kg 0.066 mg/Kg 4.0 mg/Kg 2.1 mg/Kg 2.1 mg/Kg 2.7 mg/Kg 0.35 mg/Kg 0.12 mg/Kg 0.15 mg/Kg 0.025 mg/Kg 0.69 mg/Kg	All soil samples in SDG F8A260143
ICB/CCB	Boron Cadmium Niobium Potassium Thallium Tin Titanium Tungsten Lithium	10.6 ug/L 0.1 ug/L 6.1 ug/L 7.3 ug/L 0.5 ug/L 0.2 ug/L 0.5 ug/L 0.7 ug/L 7.6 ug/L	All soil samples in SDG F8A260143

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
RINSATE-1	Cadmium	0.075 ug/L	0.50U ug/L
	Iron	46.0 ug/L	50.0U ug/L
	Molybdenum	0.60 ug/L	5.0U ug/L
	Niobium	18.0 ug/L	25.0U ug/L
	Sodium	42.8 ug/L	50.0U ug/L
	Tin	0.70 ug/L	2.0U ug/L
	Titanium	1.5 ug/L	2.0U ug/L
	Tungsten	1.7 ug/L	5.0U ug/L
TSB-HJ-01-10'	Boron	13.4 mg/Kg	26.7U mg/Kg
	Cadmium	0.12 mg/Kg	0.13U mg/Kg
	Molybdenum	0.51 mg/Kg	1.3U mg/Kg
	Niobium	9.4 mg/Kg	9.4J+ mg/Kg
	Thallium	0.32 mg/Kg	0.53U mg/Kg
	Tungsten	0.85 mg/Kg	1.3U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-09-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten Lithium		27.8U mg/Kg 0.14U mg/Kg 1.4U mg/Kg 6.9U mg/Kg 0.56U mg/Kg 1.4U mg/Kg 11.1U mg/Kg
TSB-HJ-09-10'	Boron	8.0 mg/Kg	26.6U mg/Kg
	Cadmium	0.096 mg/Kg	0.13U mg/Kg
	Molybdenum	0.74 mg/Kg	1.3U mg/Kg
	Niobium	3.4 mg/Kg	6.6U mg/Kg
	Thallium	0.20 mg/Kg	0.53U mg/Kg
	Tungsten	0.48 mg/Kg	1.3U mg/Kg
TSB-HJ-03-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten Lithium	4.3 mg/Kg 0.097 mg/Kg 0.56 mg/Kg 2.2 mg/Kg 0.19 mg/Kg 0.34 mg/Kg 3.5 mg/Kg	26.6U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 6.6U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.6U mg/Kg
TSB-HJ-03-0'-FD	Boron	3.7 mg/Kg	26.0U mg/Kg
	Cadmium	0.092 mg/Kg	0.13U mg/Kg
	Molybdenum	0.46 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.52U mg/Kg
	Tin	0.49 mg/Kg	0.52U mg/Kg
	Tungsten	0.32 mg/Kg	1.3U mg/Kg
TSB-HJ-03-10'	Boron	5.5 mg/Kg	26.5U mg/Kg
	Cadmium	0.077 mg/Kg	0.13U mg/Kg
	Molybdenum	0.40 mg/Kg	1.3U mg/Kg
	Tin	0.52 mg/Kg	0.53U mg/Kg
	Tungsten	0.33 mg/Kg	1.3U mg/Kg
	Lithium	9.2 mg/Kg	10.6U mg/Kg
TSB-HR-03-0'	Cadmium	0.095 mg/Kg	0.13U mg/Kg
	Molybdenum	0.40 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.53U mg/Kg
	Tungsten	0.27 mg/Kg	1.3U mg/Kg
	Lithium	4.9 mg/Kg	10.6U mg/Kg
TSB-HR-03-10'**	Boron	6.3 mg/Kg	26.5U mg/Kg
	Cadmium	0.066 mg/Kg	0.13U mg/Kg
	Molybdenum	0.39 mg/Kg	1.3U mg/Kg
	Tungsten	0.29 mg/Kg	1.3U mg/Kg
TSB-HJ-02-0'**	Boron	4.2 mg/Kg	26.2U mg/Kg
	Molybdenum	0.91 mg/Kg	1.3U mg/Kg
	Tungsten	0.29 mg/Kg	1.3U mg/Kg
	Lithium	3.8 mg/Kg	10.5U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-02-10'**	Boron Cadmium Molybdenum Tin Tungsten Lithium	7.1 mg/Kg 0.076 mg/Kg 0.85 mg/Kg 0.50 mg/Kg 0.30 mg/Kg 8.9 mg/Kg	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.7U mg/Kg
TSB-HR-02-0'**	Cadmium	0.12 mg/Kg	0.13U mg/Kg
	Molybdenum	0.48 mg/Kg	1.3U mg/Kg
	Tin	0.48 mg/Kg	0.53U mg/Kg
	Tungsten	0.36 mg/Kg	1.3U mg/Kg
	Lithium	4.7 mg/Kg	10.6U mg/Kg
TSB-HR-02-10'**	Boron	6.1 mg/Kg	26.5U mg/Kg
	Cadmium	0.058 mg/Kg	0.13U mg/Kg
	Molybdenum	0.47 mg/Kg	1.3U mg/Kg
	Tin	0.51 mg/Kg	0.53U mg/Kg
	Tungsten	0.37 mg/Kg	1.3U mg/Kg
TSB-HJ-11-0'**	Cadmium	0.11 mg/Kg	0.13U mg/Kg
	Molybdenum	0.52 mg/Kg	1.3U mg/Kg
	Tungsten	0.30 mg/Kg	1.3U mg/Kg
	Lithium	6.0 mg/Kg	10.5U mg/Kg
TSB-HJ-11-10'	Boron Cadmium Molybdenum Tin Tungsten Lithium	4.7 mg/Kg 0.093 mg/Kg 0.70 mg/Kg 0.52 mg/Kg 0.37 mg/Kg 10.0 mg/Kg	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.7U mg/Kg
TSB-HJ-11-10'-FD	Boron	5.2 mg/Kg	26.5U mg/Kg
	Cadmium	0.071 mg/Kg	0.13U mg/Kg
	Molybdenum	0.41 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.53U mg/Kg
	Tin	0.46 mg/Kg	0.53U mg/Kg
TSB-HR-01-0'	Boron	4.1 mg/Kg	27.4U mg/Kg
	Cadmium	0.090 mg/Kg	0.14U mg/Kg
	Molybdenum	0.46 mg/Kg	1.4U mg/Kg
	Tungsten	0.31 mg/Kg	1.4U mg/Kg
	Lithium	5.8 mg/Kg	10.9U mg/Kg
TSB-HR-01-10'	Boron	6.3 mg/Kg	26.4U mg/Kg
	Cadmium	0.068 mg/Kg	0.13U mg/Kg
	Molybdenum	0.46 mg/Kg	1.3U mg/Kg
	Tin	0.46 mg/Kg	0.53U mg/Kg
	Tungsten	0.31 mg/Kg	1.3U mg/Kg
TSB-HJ-01-0'	Molybdenum	0.76 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.52U mg/Kg
	Tungsten	0.28 mg/Kg	1.3U mg/Kg
	Lithium	6.8 mg/Kg	10.5U mg/Kg

Sample RINSATE-1 was identified as a rinsate. No metal contaminants were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Analyte	Concentration	Associated Samples
RINSATE-1	1/25/08	Aluminum Boron Cadmium Calcium Copper Iron Magnesium Manganese Molybdenum Niobium Phosphorus Potassium Silicon Sodium Strontium Thallium Tin Titanium Tungsten Zinc	10.5 ug/L 17.8 ug/L 0.075 ug/L 95.0 ug/L 0.26 ug/L 46.0 ug/L 12.5 ug/L 0.67 ug/L 18.0 ug/L 19.0 ug/L 13.5 ug/L 43.6 ug/L 42.8 ug/L 0.86 ug/L 0.73 ug/L 0.70 ug/L 1.5 ug/L 1.5 ug/L 3.2 ug/L	All soil samples in SDG F8A260143

Sample concentrations were compared to concentrations detected in the field blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-01-10'	Boron	13.4 mg/Kg	26.7U mg/Kg
	Cadmium	0.12 mg/Kg	0.13U mg/Kg
	Molybdenum	0.51 mg/Kg	1.3U mg/Kg
	Thallium	0.32 mg/Kg	0.53U mg/Kg
	Tungsten	0.85 mg/Kg	1.3U mg/Kg
TSB-HJ-09-0'	Boron	7.0 mg/Kg	27.8U mg/Kg
	Cadmium	0.086 mg/Kg	0.14U mg/Kg
	Molybdenum	0.46 mg/Kg	1.4U mg/Kg
	Niobium	4.6 mg/Kg	6.9U mg/Kg
	Thallium	0.27 mg/Kg	0.56U mg/Kg
	Tungsten	0.52 mg/Kg	1.4U mg/Kg
TSB-HJ-09-10'	Boron	8.0 mg/Kg	26.6U mg/Kg
	Cadmium	0.096 mg/Kg	0.13U mg/Kg
	Molybdenum	0.74 mg/Kg	1.3U mg/Kg
	Niobium	3.4 mg/Kg	6.6U mg/Kg
	Thallium	0.20 mg/Kg	0.53U mg/Kg
	Tungsten	0.48 mg/Kg	1.3U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-03-0'	Boron	4.3 mg/Kg	26.6U mg/Kg
	Cadmium	0.097 mg/Kg	0.13U mg/Kg
	Molybdenum	0.56 mg/Kg	1.3U mg/Kg
	Niobium	2.2 mg/Kg	6.6U mg/Kg
	Thallium	0.19 mg/Kg	0.53U mg/Kg
	Tungsten	0.34 mg/Kg	1.3U mg/Kg
TSB-HJ-03-0'-FD	Boron	3.7 mg/Kg	26.0U mg/Kg
	Cadmium	0.092 mg/Kg	0.13U mg/Kg
	Molybdenum	0.46 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.52U mg/Kg
	Tin	0.49 mg/Kg	0.52U mg/Kg
	Tungsten	0.32 mg/Kg	1.3U mg/Kg
TSB-HJ-03-10'	Boron	5.5 mg/Kg	26.5U mg/Kg
	Cadmium	0.077 mg/Kg	0.13U mg/Kg
	Molybdenum	0.40 mg/Kg	1.3U mg/Kg
	Tin	0.52 mg/Kg	0.53U mg/Kg
	Tungsten	0.33 mg/Kg	1.3U mg/Kg
TSB-HR-03-0'	Cadmium	0.095 mg/Kg	0.13U mg/Kg
	Molybdenum	0.40 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.53U mg/Kg
	Tungsten	0.27 mg/Kg	1.3U mg/Kg
TSB-HR-03-10'**	Boron	6.3 mg/Kg	26.5U mg/Kg
	Cadmium	0.066 mg/Kg	0.13U mg/Kg
	Molybdenum	0.39 mg/Kg	1.3U mg/Kg
	Tungsten	0.29 mg/Kg	1.3U mg/Kg
TSB-HJ-02-0'**	Boron	4.2 mg/Kg	26.2U mg/Kg
	Molybdenum	0.91 mg/Kg	1.3U mg/Kg
	Tungsten	0.29 mg/Kg	1.3U mg/Kg
TSB-HJ-02-10'**	Boron	7.1 mg/Kg	26.7U mg/Kg
	Cadmium	0.076 mg/Kg	0.13U mg/Kg
	Molybdenum	0.85 mg/Kg	1.3U mg/Kg
	Tin	0.50 mg/Kg	0.53U mg/Kg
	Tungsten	0.30 mg/Kg	1.3U mg/Kg
TSB-HR-02-0'**	Cadmium	0.12 mg/Kg	0.13U mg/Kg
	Molybdenum	0.48 mg/Kg	1.3U mg/Kg
	Tin	0.48 mg/Kg	0.53U mg/Kg
	Tungsten	0.36 mg/Kg	1.3U mg/Kg
TSB-HR-02-10'**	Boron	6.1 mg/Kg	26.5U mg/Kg
	Cadmium	0.058 mg/Kg	0.13U mg/Kg
	Molybdenum	0.47 mg/Kg	1.3U mg/Kg
	Tin	0.51 mg/Kg	0.53U mg/Kg
	Tungsten	0.37 mg/Kg	1.3U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-11-0'**	Cadmium	0.11 mg/Kg	0.13U mg/Kg
	Molybdenum	0.52 mg/Kg	1.3U mg/Kg
	Tungsten	0.30 mg/Kg	1.3U mg/Kg
TSB-HJ-11-10'	Boron	4.7 mg/Kg	26.7U mg/Kg
	Cadmium	0.093 mg/Kg	0.13U mg/Kg
	Molybdenum	0.70 mg/Kg	1.3U mg/Kg
	Tin	0.52 mg/Kg	0.53U mg/Kg
	Tungsten	0.37 mg/Kg	1.3U mg/Kg
TSB-HJ-11-10'-FD	Boron	5.2 mg/Kg	26.5U mg/Kg
	Cadmium	0.071 mg/Kg	0.13U mg/Kg
	Molybdenum	0.41 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.53U mg/Kg
	Tin	0.46 mg/Kg	0.53U mg/Kg
TSB-HR-01-0'	Boron	4.1 mg/Kg	27.4U mg/Kg
	Cadmium	0.090 mg/Kg	0.14U mg/Kg
	Molybdenum	0.46 mg/Kg	1.4U mg/Kg
	Tungsten	0.31 mg/Kg	1.4U mg/Kg
TSB-HR-01-10'	Boron	6.3 mg/Kg	26.4U mg/Kg
	Cadmium	0.068 mg/Kg	0.13U mg/Kg
	Molybdenum	0.46 mg/Kg	1.3U mg/Kg
	Tin	0.46 mg/Kg	0.53U mg/Kg
	Tungsten	0.31 mg/Kg	1.3U mg/Kg
TSB-HJ-01-0'	Molybdenum	0.76 mg/Kg	1.3U mg/Kg
	Thallium	0.19 mg/Kg	0.52U mg/Kg
	Tungsten	0.28 mg/Kg	1.3U mg/Kg

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-HJ-02-10'MS/MSD (All soil samples in SDG F8A260143)	Antimony	55.6 (75-125)	59.1 (75-125)	-	J- (all detects) UJ (all non-detects)	А
TSB-HJ-02-10'MS/MSD (All soil samples in SDG F8A260143)	Silicon	25.3 (75-125)	-	-	J- (all detects) R (all non-detects)	А
TSB-HJ-02-10'MS/MSD (All soil samples in SDG F8A260143)	Barium Niobium	208.4 (75-125) 159.2 (75-125)	128.1 (75-125) 187.4 (75-125)	-	J+ (all detects) J+ (all detects)	А
TSB-HJ-01-0'MS/MSD (All soil samples in SDG F8A260143)	Antimony	60.8 (75-125)	57.1 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-HJ-01-0'MS/MSD (All soil samples in SDG F8A260143)	Barium Niobium Palladium Strontium Chromium	142.2 (70-125) 159.6 (70-125) 132.1 (70-125) 194.3 (70-125)	139.2 (70-125) 159.8 (70-125) - 170.6 (70-125) 126.3 (70-125)	- - - -	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	А
TSB-HJ-01-0'MS/MSD (All soil samples in SDG F8A260143)	Phosphorus	61.9 (70-125)	29.6 (70-125)	-	J- (all detects) R (all non-detects)	А

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Niobium Palladium Platinum Tungsten	116.3 (85-115) 121.1 (85-115) 115.1 (85-115) 117.9 (85-115)	All water samples in SDG F8A260143	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	Р
LCS	Palladium	131.1 (80-120)	All soil samples in SDG F8A260143	J+ (all detects)	Р

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which a Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

	Concentration (mg/Kg)					
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Aluminum	6450	5370	18 (≤50)	-	-	<u>-</u>
Antimony	0.24	0.16	-	0.08 (≤1.3)	-	-
Arsenic	1.9	3.0	-	1.1 (≤2.7)	-	-
Barium	158	133	17 (≤50)	-	-	-
Beryllium	0.53	0.43	-	0.1 (≤0.27)	-	-
Boron	4.3	3.7	-	0.6 (≤26.6)	-	-

	Concentr	ation (mg/Kg)	BBB	Diffe		
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Cadmium	0.097	0.092	-	0.005 (≤0.13)	-	-
Calcium	12600	35100	94 (≤50)	-	-	-
Chromium	10.5	7.9	-	2.6 (≤2.7)	-	-
Cobalt	7.2	5.3	30 (≤50)	-	-	-
Copper	15.7	12.1	26 (≤50)	-	-	-
Iron	14000	9360	40 (≤50)	-	-	-
Lead	7.8	7.2	8 (≤50)		-	-
Magnesium	6300	5680	10 (≤50)	-	-	-
Manganese	362	296	20 (≤50)	-	-	-
Molybdenum	0.56	0.46	-	0.1 (≤1.3)		-
Nickel	15.4	10.2	41 (≤50)	-	-	-
Niobium	2.2	2.0U		0.2 (≤6.6)	-	-
Palladium	0.26	0.22	-	0.04 (≤1.0)	-	-
Phosphorus	1560	1350	-	210 (≤530)	-	-
Potassium	1870	1570	17 (≤50)	-	-	-
Silicon	431	373	14 (≤50)	-	-	-
Silver	0.093	0.078	-	0.015 (≤0.53)	-	-
Sodium	514	295	54 (≤50)	-	J (all detects)	А
Strontium	125	132	5 (≤50)	-	-	-
Thallium	0.19	0.19	-	0 (≤0.53)	-	

	Concentr	Concentration (mg/Kg)				
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Tin	0.56	0.49	-	0.07 (≤0.53)	-	-
Titanium	667	538	21 (≤50)	-	-	
Tungsten	0.34	0.32	-	0.02 (≤1.3)	-	-
Uranium	0.71	0.95	-	0.24 (≤0.27)	-	-
Vanadium	40.7	29.2	33 (≤50)	-	-	-
Zinc	31.5	29.0	8 (≤50)	-	-	-
Zirconium	21.1	15.9	•	5.2 (≤26.6)	-	-
Lithium	3.5	1.5U	-	2 (≤10.6)	-	-

	Concentration (ug/Kg)					
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Mercury	20.4	21.7	-	1.3 (≤35.4)	-	_

	Concentr	Concentration (mg/Kg)				
Analyte	TSB-HJ-11-10'	TSB-HJ-11-10'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Aluminum	7930	7390	7 (≤50)	-	-	-
Antimony	0.15	0.17	-	0.02 (≤1.3)	-	-
Arsenic	3.3	3.6	-	0.3 (≤2.7)	-	
Barium	198	179	10 (≤50)	-	-	-
Beryllium	0.53	0.53	-	0 (≤0.27)	-	-
Boron	4.7	5.2	-	0.5 (≤26.7)	-	-
Cadmium	0,093	0.071	-	0.022 (≤0.13)	-	-

	Concent	ation (mg/Kg)				
Analyte	TSB-HJ-11-10'	TSB-HJ-11-10'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Calcium	57400	20900	93 (≤50)	-	J (all detects)	А
Chromium	13.4	11.2	-	2.2 (≤2.7)	-	-
Cobalt	7.7	6.8	12 (≤50)	•	-	-
Copper	16.7	16.8	1 (≤50)	-	-	-
Iron	12500	12900	3 (≤50)	-	-	-
Lead	7.2	7.0	3 (≤50)	-	-	-
Magnesium	10800	10500	3 (≤50)	-	-	-
Manganese	369	330	11 (≤50)	-	-	-
Molybdenum	0.70	0.41	-	0.29 (≤1.3)	-	
Nickel	15.0	16.3	8 (≤50)	-	-	-
Palladium	0.58	0.55	_	0.03 (≤1.3)	-	-
Phosphorus	1210	1240	•	30 (≤667)	-	-
Potassium	1510	1230	20 (≤50)	-	-	-
Silicon	155	578	-	423 (≤66.7)	J (all detects)	А
Silver	0.11	0.12	-	0.01 (≤0.53)	-	-
Sodium	490	469	4 (≤50)	-	-	-
Strontium	299	230	26 (≤50)	-	-	-
Thallium	0.19U	0.19	-	0 (≤0.53)	-	-
Tin	0.52	0.46	-	0.06 (≤0.53)	-	-
Titanium	675	719	6 (≤50)	-	-	

	Concentration (mg/Kg)					
Analyte	TSB-HJ-11-10'	TSB-HJ-11-10'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Tungsten	0.37	0.27U	-	0.1 (≤1.3)	-	-
Uranium	1.2	1.2	-	0 (≤0.27)	-	-
Vanadium	38.6	43.1	11 (≤50)	-	•	-
Zinc	29.7	33.2	11 (≤50)	-	-	-
Zirconium	24.7	24.6	-	0.1 (≤26.7)	-	-
Lithium	10.0	17.1	-	7.1 (≤10.7)	<u>-</u>	-

BRC Tronox Parcel H Metals - Data Qualification Summary - SDG F8A260143

		T			
SDG	Sample	Analyte	Flag	A or P	Reason
F8A260143	TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HR-03-0' TSB-HR-03-0' TSB-HR-03-10'** TSB-HJ-02-10'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-0'** TSB-HJ-11-0'* TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0'	Silver	J+ (all detects)	Р	Calibration (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' RINSATE-1	Silver Boron Niobium	J+ (all detects) J+ (all detects) J+ (all detects)	Р	Calibration (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HR-03-10'** TSB-HJ-02-0'**	Palladium	J+ (all detects)	Р	Calibration (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HR-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-01-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0' TSB-HR-01-0'	Antimony	J- (all detects) UJ (all non-detects)	Α	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'** TSB-HR-02-0'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0'	Barium Niobium Palladium Strontium Chromium	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'** TSB-HR-02-10'** TSB-HJ-02-10'** TSB-HR-02-10'** TSB-HJ-11-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HR-01-0' TSB-HR-01-0'	Silicon Phosphorus	J- (all detects) R (all non-detects) J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A260143	RINSATE-1	Niobium Palladium Platinum Tungsten	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	Р	Laboratory control samples (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-10'** TSB-HR-03-10'** TSB-HR-02-0'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10'	Palladium	J+ (all detects)	Р	Laboratory control samples (%R)
F8A260143	TSB-HJ-03-0' TSB-HJ-03-0'-FD	Sodium	J (all detects)	А	Field duplicates (RPD)
F8A260143	TSB-HJ-11-10' TSB-HJ-11-10'-FD	Calcium	J (all detects)	А	Field duplicates (RPD)
F8A260143	TSB-HJ-11-10' TSB-HJ-11-10'-FD	Silicon	J (all detects)	А	Field duplicates (Difference)

BRC Tronox Parcel H Metals - Laboratory Blank Data Qualification Summary - SDG F8A260143

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	RINSATE-1	Cadmium Iron Molybdenum Niobium Sodium Tin Titanium Tungsten	0.50U ug/L 50.0U ug/L 5.0U ug/L 25.0U ug/L 50.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L	А
F8A260143	TSB-HJ-01-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 9.4J+ mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	TSB-HJ-09-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten Lithium	27.8U mg/Kg 0.14U mg/Kg 1.4U mg/Kg 6.9U mg/Kg 0.56U mg/Kg 1.4U mg/Kg 11.1U mg/Kg	Α
F8A260143	TSB-HJ-09-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	26.6U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 6.6U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	Α
F8A260143	TSB-HJ-03-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten Lithium	26.6U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 6.6U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.6U mg/Kg	Α
F8A260143	TSB-HJ-03-0'-FD	Boron Cadmium Molybdenum Thallium Tin Tungsten	26.0U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.52U mg/Kg 0.52U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-03-10'	Boron Cadmium Molybdenum Tin Tungsten Lithium	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.6U mg/Kg	А
F8A260143	TSB-HR-03-0'	Cadmium Molybdenum Thallium Tungsten Lithium	0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.6U mg/Kg	А
F8A260143	TSB-HR-03-10'**	Boron Cadmium Molybdenum Tungsten	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 1.3U mg/Kg	A
F8A260143	TSB-HJ-02-0'**	Boron Molybdenum Tungsten Lithium	26.2U mg/Kg 1.3U mg/Kg 1.3U mg/Kg 10.5U mg/Kg	А

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	TSB-HJ-02-10'**	Boron Cadmium Molybdenum Tin Tungsten Lithium	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.7U mg/Kg	А
F8A260143	TSB-HR-02-0'**	Cadmium Molybdenum Tin Tungsten Lithium	0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.6U mg/Kg	А
F8A260143	TSB-HR-02-10'**	Boron Cadmium Molybdenum Tin Tungsten	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A260143	TSB-HJ-11-0'**	Cadmium Molybdenum Tungsten Lithium	0.13U mg/Kg 1.3U mg/Kg 1.3U mg/Kg 10.5U mg/Kg	A
F8A260143	TSB-HJ-11-10'	Boron Cadmium Molybdenum Tin Tungsten Lithium	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg 10.7U mg/Kg	A
F8A260143	TSB-HJ-11-10'-FD	Boron Cadmium Molybdenum Thallium Tin	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 0.53U mg/Kg	А
F8A260143	TSB-HR-01-0'	Boron Cadmium Molybdenum Tungsten Lithium	27.4U mg/Kg 0.14U mg/Kg 1.4U mg/Kg 1.4U mg/Kg 10.9U mg/Kg	А
F8A260143	TSB-HR-01-10'	Boron Cadmium Molybdenum Tin Tungsten	26.4U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A260143	TSB-HJ-01-0'	Molybdenum Thallium Tungsten Lithium	1.3U mg/Kg 0.52U mg/Kg 1.3U mg/Kg 10.5U mg/Kg	А

BRC Tronox Parcel H Metals - Field Blank Data Qualification Summary - SDG F8A260143

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	TSB-HJ-01-10'	Boron Cadmium Molybdenum Thallium Tungsten	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-09-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	27.8U mg/Kg 0.14U mg/Kg 1.4U mg/Kg 6.9U mg/Kg 0.56U mg/Kg 1.4U mg/Kg	А
F8A260143	TSB-HJ-09-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	26.6U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 6.6U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	Α
F8A260143	TSB-HJ-03-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	26.6U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 6.6U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-03-0'-FD	Boron Cadmium Molybdenum Thallium Tin Tungsten	26.0U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.52U mg/Kg 0.52U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-03-10'	Boron Cadmium Molybdenum Tin Tungsten	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HR-03-0'	Cadmium Molybdenum Thallium Tungsten	0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A260143	TSB-HR-03-10'**	Boron Cadmium Molybdenum Tungsten	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 1.3U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	TSB-HJ-02-0'**	Boron Molybdenum Tungsten	26.2U mg/Kg 1.3U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-02-10'**	Boron Cadmium Molybdenum Tin Tungsten	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A260143	TSB-HR-02-0'**	Cadmium Molybdenum Tin Tungsten	0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HR-02-10'**	Boron Cadmium Molybdenum Tin Tungsten	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-11-0'**	Cadmium Molybdenum Tungsten	0.13U mg/Kg 1.3U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-11-10'	Boron Cadmium Molybdenum Tin Tungsten	26.7U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A260143	TSB-HJ-11-10'-FD	Boron Cadmium Molybdenum Thallium Tin	26.5U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 0.53U mg/Kg	A
F8A260143	TSB-HR-01-0'	Boron Cadmium Molybdenum Tungsten	27.4U mg/Kg 0.14U mg/Kg 1.4U mg/Kg 1.4U mg/Kg	A
F8A260143	TSB-HR-01-10'	Boron Cadmium Molybdenum Tin Tungsten	26.4U mg/Kg 0.13U mg/Kg 1.3U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	А
F8A260143	TSB-HJ-01-0'	Molybdenum Thallium Tungsten	1.3U mg/Kg 0.52U mg/Kg 1.3U mg/Kg	А

SDG Labo	#: 18356A4 #: F8A260143 ratory: Test America HOD: Metals (EPA SW 8			Le	evel		ESS WORKSHEI	ΕT	Date: > > of Page: of Page: of Page: On Reviewer:	
The s	samples listed below were ation findings worksheets	e revi	ewed for ead	ch of the fo	ollowi	ng v	alidation areas. Valid	ation findi	ngs are noted in attached	
	Validation	Δτος					Cor	nments		
1.	Technical holding times			4	Samp	olina d				
II.	Calibration			5W			/ 5 / 0			
III.	Blanks			\$W						
IV.	ICP Interference Check Sar	mple (I	CS) Analysis	#						
V.	Matrix Spike Analysis			5W		7 M	s Aug b			
VI.	Duplicate Sample Analysis			7		>	/			
VII.	Laboratory Control Sample	s (LCS)	SW	L	e g	7			
VIII.	Internal Standard (ICP-MS)			A	V 1	bit nurewell for lene 3				
IX.	Furnace Atomic Absorption	QC		N	ĮJ.	+	utilized	1 -		
Χ.	ICP Serial Dilution			A						
XI.	Sample Result Verification			À'	Not reviewed for Level III validation.					
XII.	Overall Assessment of Data	а		A						
XIII.	Field Duplicates			5W		(4,5) (14,15)				
XIV	Field Blanks			SW		R >	-19	,		
Note: Valida	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples: ** Indicates sam	ple un	R = Rins FB = Fid derwent Level I	eld blank			D = Duplicate TB = Trip blank EB = Equipment l	blank		
1	TSB-HJ-01-10'	11	TSB-HR-02-0	• • •		21	TSB-HJ-02-10'MSD	31		
2	TSB-HJ-09-0'	12	TSB-HR-02-1			22	TSB-HJ-01-0'MS	32	, , , , , , , , , , , , , , , , , , , ,	
3	TSB-HJ-09-10'	13	TSB-HJ-11-0"			23	TSB-HJ-01-0'MSD	33		
4,	TSB-HJ-03-0'	14	TSB-HJ-11-10			24	RINSATE-1MS	34		
5	TSB-HJ-03-0'-FD	15	TSB-HJ-11-10			25	RINSATE-1MSD	35		
6	TSB-HJ-03-10'	16	TSB-HR-01-0			26	prs	36		
7	TSB-HR-03-0'	17	TSB-HR-01-1	0'		27		37		
8	TSB-HR-03-10'**	18	TSB-HJ-01-0'			28		38		
9	TSB-HJ-02-0'**	19	RINSATE-1	da		29		39		
10	TSB-HJ-02-10'**	20	TSB-HJ-02-10	O'MS		30		40		

Notes:_

VALIDATION FINDINGS CHECKLIST

Method: Metals (EPA SW 846 Method 6010/7000/6020)

Method:Metals (EPA SW 846 Method 6010/7000/6020)	.,	,		
Validation Area	Yes	No	NA	Findings/Comments
I. Technical fiolding times		1:1:	N.	
All technical holding times were met.	1			
Cooler temperature criteria was met.			OFFI STATE OF THE	
L.Calibration				
Were all instruments calibrated daily, each set-up time?	_			
Were the proper number of standards used?	/			
Were all initial and continuing calibration verification %Rs within the 90-110% (80- 120% for mercury and 85-115% for cyanide) QC limits?		_		
Were all initial calibration correlation coefficients > 0.995? (Level IV only)		34-V de R.S.		
III) Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	/			
IV. ICE Interference/Check Sample:				
Were ICP interference check samples performed daily?	\checkmark			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?		H TOOKS W	7000 TH	
IV-Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		1		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.				
V-Laboratory control samples				
Was an LCS anaylzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?				
VI-Furnace Atomic Absorption QC				Company of the compan
If MSA was performed, was the correlation coefficients > 0.995?				
Do all applicable analysies have duplicate injections? (Level IV only)	\dashv			
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			/	
Were analytical spike recoveries within the 85-115% QC limits?				

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: WM 2nd Reviewer: And

Validation Area	Yes	No	NA	Findings/Comments
MILICR Senal Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	V		<u> </u>	7100 Kmgr Lup/ms
Were all percent differences (%Ds) < 10%?	/			/
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			/	
VIII internat Standards (EPA/SW 845 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?				
If the %Rs were outside the criteria, was a reanalysis performed?				
DX: Regional Quality Assurance and Quality Control				是是是1000年的11年的11年的11年的11年的11年的11年的11年的11年的11
Were performance evaluation (PE) samples performed?			_	:
Were the performance evaluation (PE) samples within the acceptance limits?	00.000.0000			
X. Sample Result Verification (32.4)				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XI Overall assessment of plate				
Overall assessment of data was found to be acceptable.	7			
KII Field duplicates 200 Feb. 1997 1997 1997 1997 1997 1997 1997 199				
Field duplicate pairs were identified in this SDG.	1			
Target analytes were detected in the field duplicates.				
XIIISField blanks a				
Field blanks were identified in this SDG.				
Target analytes were detected in the field blanks.	1			

LDC #: 18356Af SDG #: See com

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: of / Reviewer: 2nd reviewer: 2nd reviewer:

All circled elements are applicable to each sample.

Sample ID		Target Analyte List (TAL)
1-19	Sort	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
10,01	501-	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
22,23	ト	Al, Sb. As, Ba, Be, Cd. Ca, Cr. Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
24,45	m	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si,
1-19	Soil /n	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
	_,	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
>0 <√	701-1	(Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li <u>, S, Zr,</u>)
25.27)	<u> </u>	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
V4. V5	Kr	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Analysis Method
ICP		(Li, 9)
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
ICP-MS		(Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr,
GEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Ph, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN

GFAA

Al, Sh, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Ph, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN

Comments: Mercury by CVAA if performed

Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

18356 FT LDC #:

VALIDATION FINDINGS WORKSHEET Calibration

₹ • 2nd Reviewer: and Page: Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A",

Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-Y N N/A

120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Was a midrange cyanide standard distilled?

Are all correlation coefficients >0.995?

Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

# Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
112/2/08	(gray)	_ ا	11,4	An da	かける
,					
2 2 (5/0)	(2/x)) A-9.	9、<)	1 + 13	PBS /
			\{\z\}		
		Nb	111.8	4	
7 6 %	(AC00) VA	Ag	9111	1 6 × - 00 . 30 - 23	J+4+76
		ρ			
3 2 61.8	(41)	7	(12,7)	5x'xx'8]-11	J+ 1+/P
	/	ρ			, /
タンロング	(4cs) M3	Pa	× :=:	1-4. PBS	
× 9/2 /2	(xcd)	10	112.3	1 1 1 20 X	2/ DBS V
Collineries.					

CAL.4SW

LDC #: 18356A4

SDG #: See Cover METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: All AQ Associated Samples:_

Reviewer:

										:									
																			100
-																			
												:							
tificatio																			14
Sample Identification																			
Sam																			2;1 × 2 × 3
																			Connection and listed above with the identification of from the IV-listed to Committee of Transfer of the identification of the iden
																			<u></u>
																			- 3
N.F.																			
ŀ			05.0		0.0	2.0	5.0	0.0	5.0	0.	0.								
	19		0.075 / 0.50		46.0 / 50.0	0.60 / 5.0	18.0 / 25.0	42.8 / 50.0	0.70 / 2.0	1.5/2.0	1.7 / 5.0								7
	Blank Action I imit						T nu												700004
	Maximum ICB/CCB ^a	0.2	0.1			0.2	6.1			1.2	9.0								
F																		 	
	Maximum PB ^a (uq/l)	0.27	0.065	2.3	12.6			9.9	0.48	1.3	0.27								Citertago
	Maximum PB ^a (mg/Kg)																		Commiss with analytic consortations within five times the consortated ICB CCB as DB
	Analyte	Sb	S	ċ	Fe	Mo	QP Q	Na	Sn	F	M								Him solume

quainfed as not uetected, o . Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

VALIDATION FINDINGS WORKSHEET

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)

SDG #: See Cover LDC #: 18356A4

PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: 2nd Reviewer: 3nd Page: Yof

> Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X Associated Samples: 6 42 At Sor

Sample Concentration units, unless otherwise noted: mg/Kg

									Sample Id	Sample Identification				
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/l)	Maximum ICB/CCB ^a (uq/L)	Blank Action I imit	-	2	દ	4	5	9	7	ω	o	10
Ba	0.059													
В	4.2		10.6		13.4 / 26.7	7.0 / 27.8	8.0 / 26.6	4.3 / 26.6	3.7 / 26.0	5.5 / 26.5		6.3 / 26.5	4.2 / 26.2	7.1 / 26.7
පි			0.1		0.12 / 0.13	0.086 / 0.14	0.096 / 0.13	0.097 / 0.13	0.092 / 0.13	0.077 / 0.13	0.095 / 0.13	0.066 / 0.13		0.076 / 0.13
ప	0.20													
Мо	0.066				0.51 / 1.3	0.46 / 1.4	0.74 / 1.3	0.56 / 1.3	0.46 / 1.3	0.40 / 1.3	0.40 / 1.3	0.39 / 1.3	0.91 / 1.3	0.85 / 1.3
N _D	4.0		6.1	40	9.4 J+	4.6 / 6.9	3.4 / 6.6	2.2 / 6.6						
Д	2.1													
ᅩ	2.1		7.3											
Na	2.7													
E	0.35	,	0.5	3.5	0.32 / 0.53	0.27 / 0.56	0.20 / 0.53	0.19 / 0.53	0.19 / 0.52		0.19 / 0.53			
Sn	0.12		0.2						0.49 / 0.52	0.52 / 0.53				0.50 / 0.53
F	0.15		0.5											
*	0.39		0.7		0.85 / 1.3	0.52 / 1.4	0.48 / 1.3	0.34 / 1.3	0.32 / 1.3	0.33 / 1.3	0.27 / 1.3	0.29 / 1.3	0.29 / 1.3	0.30 / 1.3
ח	0.025												- Contraction of the Contraction	
Zn	69.0													
<u>:</u>			7.6			8.4 / 11.1		3.5 / 10.6		9.2 / 10.6	4.9 / 10.6		3.8 / 10.5	8.9 / 10.7
Samples	vith analyte c	oncentration	s within five tin	nes the assu	ciated ICB. CC	3B or PB conce	Intration are list	ed above with th	ne identification	s from the Valid	Jation Complete	Samples with analyte concentrations within five times the associated ICB. CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were	of These samr	lo roes alte vaoro

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18356A4 SDG #: See Cover

Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)

PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X Associated Samples: <u>6-12</u> Al \$or\tag{H}

Page: 3 of 3 Reviewer: Reviewer: MR

Analyte	Maximum PB³ (mα/Kα)	Maximum PB ^a (ud/l)	Maximum ICB/CCB ^a (ug/L)	Blank Action I imit	11	12	13	14	15	16	17	8	
Ba	0.059												
	4.2		10.6			6.1 / 26.5		4.7 / 26.7	5.2 / 26.5	4.1 / 27.4	6.3 / 26.4	-	
පි			0.1		0.12 / 0.13	0.058 / 0.13	0.11/0.13	0.093 / 0.13	0.071 / 0.13	0.090 / 0.14	0.068 / 0.13		
ن	0.20												
Mo	0.066				0.48 / 1.3	0.47 / 1.3	0.52 / 1.3	0.70 / 1.3	0.41 / 1.3	0.46 / 1.4	0.46 / 1.3	0.76 / 1.3	
Q Q	4.0		6.1	40									
	2.1												
	2.1		7.3										
Na	2.7												
	0.35		0.5	3.5					0.19 / 0.53			0.19 / 0.52	
Sn	0.12		0.2		0.48 / 0.53	0.51 / 0.53		0.52 / 0.53	0.46 / 0.53		0.46 / 0.53		
ï	0.15		0.5										
8	0.39		0.7		0.36 / 1.3	0.37 / 1.3	0.30 / 1.3	0.37 / 1.3		0.31 / 1.4	0.31 / 1.3	0.28 / 1.3	
	0.025												
Zn	0.69												:
ij			7.6		4.7 / 10.6	,	6.0 / 10.5	10.0 / 10.7		5.8 / 10.9		6.8 / 10.5	
										:			

qualified as not detected, "U". Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18356A4

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: ☐of ► Reviewer: ☑ Znd Reviewer: ੴ

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)

N/A Were field blanks identified in this SDG?

Blank units: ug/L Associated sample units: mg/Kg Sampling date: 1/25/08 Soil factor applied 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: R

Associated Samples: All Soil

Analyte	Blank ID					S	Sample Identification	dentification				
	19	Action Level	-	2		4	5	9	7	8	6	10
A	10.5											
В	17.8		13.4 / 26.7	7.0 / 27.8	8.0 / 26.6	4.3 / 26.6	3.7 / 26.0	5.5 / 26.5		6.3 / 26.5	4.2 / 26.2	7.1 / 26.7
8	0.075		0.12/0.13	0.086 / 0.14	0.096 / 0.13	0.097 / 0.13	0.092 / 0.13	0.077 / 0.13	0.095 / 0.13	0.066 / 0.13		0.076 / 0.13
Ca	95.0											
Cn	0.26		:									-
Fe	46.0											
Mg	12.5											
Mn	0.67											
Mo	09:0		0.51 / 1.3	0.46 / 1.4	0.74 / 1.3	0.56 / 1.3	0.46 / 1.3	0.40 / 1.3	0.40 / 1.3	0.39 / 1.3	0.91 / 1.3	0.85 / 1.3
δ	18.Ô			4.6 / 6.9	3.4 / 6.6	2.2 / 6.6						
۵	19.0											
エ	13.5							-				
S	43.6											
Na	42.8											
Sr	0.86											
F	0.73		0.32 / 0.53	0.27 / 0.56	0.20 / 0.53	0.19 / 0.53	0.19 / 0.52		0.19 / 0.53			
Sn	0.70						0.49 / 0.52	0.52 / 0.53				0.50 / 0.53
F	1.5											
8	1.7		0.85 / 1.3	0.52 / 1.4	0.48 / 1.3	0.34 / 1.3	0.32 / 1.3	0.33 / 1.3	0.27 / 1.3	0.29 / 1.3	0.29 / 1.3	0.30 / 1.3
72	·											

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET

Page: Yof Y

Reviewer: 200

Field Blanks

Were field blanks identified in this SDG?

N N/A

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)

SDG #: See Cover LDC #: 18356A4

Were target analytes detected in the field blanks? Blank units: ug/L Associated sample units: mg/Kg

200X Soil factor applied_ Sampling date: 1/25/08

Associated Samples: All Soil ď Field blank type: (circle one) Field Blank / Rinsate / Other.

																					_
	18									0.76 / 1.3							0.19 / 0.52			0.28 / 1.3	
	17		6.3 / 26.4	0.068 / 0.13						0.46 / 1.3								0.46 / 0.53		0.31 / 1.3	
ation	16		4.1/27.4	0.090 / 0.14						0.46 / 1.4										0.31 / 1.4	
Sample Identification	15		5.2 / 26.5	0.071 / 0.13						0.41 / 1.3							0.19 / 0.53	0.46 / 0.53			
S	14		4.7 / 26.7	0.093 / 0.13						0.70 / 1.3								0.52 / 0.53		0.37 / 1.3	
	13			0.11 / 0.13						0.52 / 1.3										0.30 / 1.3	
	12		6.1 / 26.5	0.058 / 0.13						0.47 / 1.3								0.51 / 0.53		0.37 / 1.3	
	11			0.12/0.13						0.48 / 1.3							111111111111111111111111111111111111111	0.48 / 0.53		0.36 / 1.3	
	Action Level																				
Blank ID	19	10.5	17.8	0.075	95.0	0.26	46.0	12.5	0.67	09.0	18.0	19.0	13.5	43.6	42.8	0.86	0.73	0.70	1.5	1.7	
Analyte		IA	В	PO	Ca	Cu	Fe	Mg	Min	Mo	qN	Ь	У	Si	Na	Sr	ΙL	Sn	ΙL	W	ı

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

SDG #: Seg Con LDC #: 1833644

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Reviewer: My 2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Rease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a matrix spike analyzed for each matrix in this SDG?

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken. A A A

Were all duplicate sample relative percent differences (RPD) < 20% for water samples and <35% for soil samples? Y (N) N/A Wer LEVEL IV ONLY:

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. N N/A

MS/MSD ID	Matrtx	Analyte	%Recovery	%Recovery	RPD (Limits)	Associated Samples	Qualifications
12/05	(105)	45	4.75	59.1		11 50-11	J-/41/A
		βc	7.805	1.821			ツキナナ
		9.7	7(2)	7481		\	
		٠٤.	25.3				T-/R/A
				-			
ングベ	505	9.b	8.09	1.45		1105 14	7-143/0
		Ba	142,2	139.2	•		7-14/4
		q_N	159,6	159.8		>	/ 1
		Pol	(32 ·)				>
		4	61.9	29.6			J-/ A /4
		\2\cdot\	(44/3	1 40.6			オンナク
		ريد		5,94			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
		4		38.6			

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a matrix spike analyzed for each matrix in this SDG?

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample conc

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken.

Were all duplicate sample relative percent differences (RPD) < 20% for water samples and <35% for soil samples?

Y N N/A Wer LEVEL IV ONLY:

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

*	QI QSW/SW	Matrix	Analyte	MS	MSD	657			
1		7	10	Alaxonaus	AR SCOVBLY	KPD (ISMRS)	Associated Samples	Qualifications	
1		2				6, 5 2	M1 Soill	1527) Jup 6	
\perp L			38			1	. 1		
\perp			ક			2/29			
			5,			7),4			
			82			ě			
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ĕ	Comments:			٠					

18356 /44 LDC #:

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Reviewer: MH 2nd Reviewer: 3MH Page: Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N N/A Was
Y N N/A Wer
LEKEL IV ONLY:
Y N N/A Wer

Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?
Were all aqueous LCS percent recoveries (%R) within the control limits of 80,120% and all soil LCS %R within laboratory established control limits.

Y: Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

*	and the state of t				
ŀ	Wallix	Analyte	%R (limits)	Associated Samples	
173	Ŧ	Nβ	116,3 (84-115)	4.	dualineations
	-	Po	1 <1		0/17+7
		+4	-1-1-		
		/W	8 9		
		,		7	
75	-				
	100	9	$(\infty - \infty)$	- S	74.44
				,	
			•		
Comments:					

LDC#:__18356A4 SDG#:_See Cover____

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: __of__ Reviewer: ____ 2nd Reviewer: ____

METHOD: Metals (EPA Method 6010B/6020/7000)

N NA YN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentrati	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	4	5	RPD	Difference	Limits	(Parent Only)
Aluminum	6450	5370	18			
Antimony	0.24	0.16		0.08	(≤1.3)	
Arsenic	1.9	3.0		1.1	(≤2.7)	
Barium	158	133	17			
Beryllium	0.53	0.43		0.1	(≤0.27)	
Boron	4.3	3.7		0.6	(≤26.6)	
Cadmium	0.097	0.092		0.005	(≤0.13)	
Calcium	12600	35100	94			
Chromium	10.5	7.9		2.6	(≤2.7)	
Cobalt	7.2	5.3	30			
Copper	15.7	12.1	26			
Iron	14000	9360	40		,	
Lead	7.8	7.2	8			
Magnesium	6300	5680	10			
Manganese	362	296	20			
Molybdenum	0.56	0.46		0.1	(≤1.3)	
Nickel	15.4	10.2	41			
Niobium	2.2	2.0U		0.2	(≤6.6)	
Palladium	0.26	0.22		0.04	(≤1.0)	

LDC#: <u>18356A4</u> SDG#: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET _Field Duplicates

Page: of Reviewer: 2nd Reviewer: 2m. A

METHOD: Metals (EPA Method 6010B/6020/7000)

YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentrati	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	4	5	RPD	Difference	Limits	(Parent Only)
Phosphorus	1560	1350		210	(≤530)	
Potassium	1870	1570	17			
Silicon	431	373	14			
Silver	0.093	0.078		0.015	(≤0.53)	
Sodium	514	295	54			J det / A
Strontium	125	132	5			
Thallium	0.19	0.19		0	(≤0.53)	
Tin	0.56	0.49		0.07	(≤0.53)	
Titanium	667	538	21			
Tungsten	0.34	0.32		0.02	(≤1.3)	
Uranium	0.71	0.95		0.24	(≤0.27)	
Vanadium	40.7	29.2	33			
Zinc	31.5	29.0	8			
Zirconium	21.1	15.9		5.2	(≤26.6)	
Lithium	3.5	1.5U		2	(≤10.6)	
Mercury (ug/Kg)	20.4	21.7		1.3	(≤35.4)	

	Concentrati	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	14	15	RPD	Difference	Limits	(Parent Only)
Aluminum	7930	7390	7			

LDC#: <u>18356A4</u> SDG#: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: 3 of 4 Reviewer: 2nd Reviewer: 91/14

METHOD: Metals (EPA Method 6010B/6020/7000)

YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentration	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	14	15	RPD	Difference	Limits	(Parent Only)
Antimony	0.15	0.17		0.02	(≤1.3)	
Arsenic	3.3	3.6		0.3	(≤2.7)	
Barium	198	179	10			
Beryllium	0.53	0.53		0	(≤0.27)	
Boron	4.7	5.2		0.5	(≤26.7)	
Cadmium	0.093	0.071		0.022	(≤0.13)	
Calcium	57400	20900	93			J det / A
Chromium	13.4	11.2		2.2	(≤2.7)	
Cobalt	7.7	6.8	12			
Соррег	16.7	16.8	1			
Iron	12500	12900	3			
Lead	7.2	7.0	3			
Magnesium	10800	10500	3			
Manganese	369	330	11			
Molybdenum	0.70	0.41		0.29	(≤1.3)	
Nickel	15.0	16.3	8			
Palladium	0.58	0.55		0.03	(≤1.3)	
Phosphorus	1210	1240		30	(≤667)	
Potassium	1510	1230	20			

LDC#: <u>18356A4</u> SDG#: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: Ψ of Ψ Reviewer: 2nd Reviewer: 9^{n}

METHOD: Metals (EPA Method 6010B/6020/7000)

N NA N NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentrati	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	14	15	RPD	Difference	Limits	(Parent Only)
Silicon	155	578		423	(≤66.7)	J det / A
Silver	0.11	0.12		0.01	(≤0.53)	
Sodium	490	469	4			
Strontium	299	230	26			
Thallium	0.19U	0.19		0	(≤0.53)	
Tin	0.52	0.46		0.06	(≤0.53)	
Titanium	675	719	6			
Tungsten	0.37	0.27U		0.1	(≤1.3)	
Uranium	1.2	1.2		0	(≤0.27)	
Vanadium	38.6	43.1	11			
Zinc	29.7	33.2	11			
Zirconium	24.7	24.6		0.1	(≤26.7)	
Lithium	10.0	17.1		7.1	(≤10.7)	

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Jee Carr LDC #: 18356 AY SDG#:

Initial and Continuing Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

Reviewer: WHY
2nd Reviewer: Auf _of__ Page:__/

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution True = concentration (in ug/L) of each analyte in the ICV or CCV source

					Recalculated	Reported	
Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L.)	%R	%R	Acceptable (Y/N)
Tw	ICP (Initfal calibration)	,'T	<10h	7 600	(00.3	(.e.)	>
	GFAA (Initial calibration)						
τω	CVAA (Initial calibration)	£	2.5	£ ŕ	∫ '°°)	t '00)	>
cw	ICP (Continuing calibration)	> V)	39180	0000	296	7.66	
	GFAA (Continuing calibration)						7,
ca	CVAA (Continuing calibration)	(4)	5004	4.0	8710)	870)	>
TW	ICP/MS (Initial calibration)	\mathcal{A} \times \ti	9-801	02	1043	(043	
ca	ICP/MS (Continuing calibation)	\wedge	209.93	7.0	(o4.9	670)	>

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: (833PAY

VALIDATION FINDINGS WORKSHEET **Level IV Recalculation Worksheet**

Reviewer: Aud 2nd Reviewer: Page: of_

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found x 100 True

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).

True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = <u>IS-D|</u> x 100 (S+D)/2

Where, S = Original sample concentration D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

%D = 1-SDR x 100

Where, 1 = Initial Sample Result (mg/L) SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	%R/RPD/%D	%R/RPD/%D	Acceptable (Y/N)
75/875	ICP interference check	cd	(08.15	00)	~ sc)	T. Se 1	h
, vc)	Laboratory control sample	√5	113,88	0.)	13.9	13-9	
) V	Matrix spike	\$	Ser-sky b, 28	89.90)	80.3	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
$ \lambda _{\sigma \lambda}$	Duplicate	NP	≯ 88€	3959	0,51	0-21	/
01	ICP serial dilution	λ5	483,3	456.23	5-9	6-5	T

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:	(8356A	4
SDG #:	_	core

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	1 or 2
Reviewer:_	<u></u>
2nd reviewer:	mr)

METHO	D: Trac	ce Metals (EPA SW 846 Met	od 6010/7000)	
Please Y N I Y N I	see qua N/A N/A N/A	difications below for all ques Have results been reported Are results within the calib Are all detection limits belo	ions answered "N". Not applicable questions are identified as "N/A". and calculated correctly? ated range of the instruments and within the linear range of the ICP? w the CRDL?	
Detecte		te results for	(© were recalculated and verified using the	
Concentr	ration =	(RD)(FV)(Dil) (In. Vol.)(%S)	Recalculation:	,
RD FV In. Vol. Dil	= = = = = = = = = = = = = = = = = = = =	Raw data concentration Final volume (ml) Initial volume (ml) or weight (G) Dilution factor Decimal percent solids	Be = 0.9158 mg/LX 0.1e x 2.5 = 0,4884	My

Sample ID	Analyte	Reported Concentration (Wf ///)	Calculated Concentration (Wy ky)	Acceptable (Y/N)
10	L	8.9	8-3	4
	AL	6860	6810	<u>\</u>
	Sp	0.19	0,19	
	As	3,7	3.7'	
	32	126	126	
	Be	0,49	0.49	
	ß	7-1	7-1'	
	Cd	0.076	0.096	
	Ca	39100	39100	
	9	10.7	10,7	
	Co	6.3	6.3	
	Cn	14,8	14.8	
	Fe Pb	12000	12000	
	Pb	6.3	6,3	
	Mg	9000	9000	
	My	>54	MY	
	140	280	0.85	
	٧ì	135	13.5	
	PJ	0.5	0.5)	
	P	(070	1070	
	K	1>30	1230	/
	51	765	765	

LDC #:		
SDG #:	Sec	cover

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

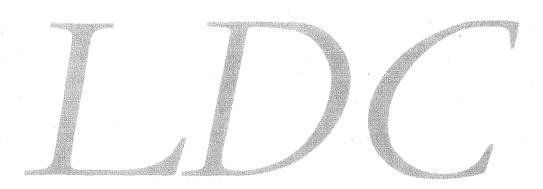
Page:_	1_01_1
Reviewer:	MH
2nd reviewer:	an E

METH	OD: Tra	ce Metals (EPA SW 846 Method 6	010/7000)		
Please Y N M N Y N	see qua N/A N/A N/A	alifications below for all questions Have results been reported and Are results within the calibrated Are all detection limits below the	calculated correctly? range of the instruments and		
Detect	ed analy	/te results for	10	were recalculated a	nd verified using the
followi	ng equa	tion:			The termon dening the
Concen	tration =	(RD)(FV)(Dil) (In. Vol.)(%S)	Recalculation:		
RD	=	Raw data concentration	7, 54,2	9/7/LX0.18X25 -58X0.9374	- 20 9/ MI/
FV	==	Final volume (ml)	N =	. 6	- 20, 16 0/W
in. Vol.	=	Initial volume (ml) or weight (G)	\mathcal{O}_{\cdot}	L 57X 0.937Y	7 0
Dil	=	Dilution factor		- 0 / / /	•
%S	=	Decimal percent solids			

Sample ID	Analyte	Reported Concentration	Calculated Concentration (Acceptable (Y/N)
(0	Ag	0/ /	0.130	Y
	N A	736	136	7
	<i>₩</i>	743	243	
	5 N	0.70	0.50	
	Ti	604	604	
	M	0.30	0,29	
	4	1.7	1.7	
	V	36.6	36.6	
	Zŋ	29.0	40	
		>}.~	23,2	J

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Wet Chemistry



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Wet Chemistry

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'** TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HR-02-0'** TSB-HR-02-10'** TSB-HJ-11-0'** TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0' **RINSATE-1**

TSB-HJ-09-0'MS

TSB-HJ-09-0'MSD TSB-HJ-02-10'MS TSB-HJ-02-10'DUP TSB-HJ-01-0'MS TSB-HJ-01-0'DUP RINSATE-1MS RINSATE-1DUP

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 24 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 9071B and EPA Method 1664A for Oil & Grease.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

Sample "RINSATE-1" was identified as a rinsate. No contaminant concentrations were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Analyte	Concentration	Associated Samples
RINSATE-1	1/25/08	Sulfate	0.067 mg/L	All soil samples in SDG F8A260143

Sample concentrations were compared to concentrations detected in the field blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HR-03-0'	Sulfate	5.1 mg/Kg	5.3U mg/Kg
TSB-HR-01-0'	Sulfate	2.2 mg/Kg	5.5U mg/Kg

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-HJ-02-10'MS (All soil samples in SDG F8A260143)	Oil & grease	62 (75-125)	-	-	J- (all detects) UJ (all non-detects)	А
TSB-HJ-02-10'MS (TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-02-10'**)	Sulfate	44 (75-125)	-	-	J- (all detects) UJ (all non-detects)	А
TSB-HJ-01-0'MS (All soil samples in SDG F8A260143)	Oil & grease	71 (75-125)	-	•	J- (all detects) UJ (all non-detects)	А

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentration (mg/Kg)					
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Chloride	4.4	0.85	-	3.55 (≤2.1)	J (all detects)	А

	Concentration (mg/Kg)					
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Chlorine	8.7	1.7	-	7 (≤4.3)	J (all detects)	А
Fluoride	0.60	0.70	-	0.1 (≤1.1)	-	-
Nitrate as N	10.3	1.9	138 (≤50)	-	J (all detects)	Α
Sulfate	92.3	87.4	5 (≤50)	•	-	-

	Concentration (ug/Kg)					
Analyte	TSB-HJ-03-0'	TSB-HJ-03-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Perchlorate	19.9	284	-	264.1 (≤42.5)	J (all detects)	A

	Concentra	tion (mg/Kg)				
Analyte	TSB-HJ-11-10'	TSB-HJ-11-10'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Chloride	10.8	8.9	•	1.9 (≤2.1)	-	-
Chlorine	21.5	17.7	-	3.8 (≤4.3)	-	-
Fluoride	1.3	1.7	-	0.4 (≤1.1)	-	-
Nitrate as N	1.2	0.97	21 (≤50)	-	-	-
Sulfate	24.4	29.1	•	4.7 (≤5.3)	-	-

	Concentration (ug/Kg)					
Analyte	TSB-HJ-11-10'	TSB-HJ-11-10'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Perchlorate	3.6U	170	•	166.4 (≤42.7)	J (all detects) UJ (all non-detects)	А

BRC Tronox Parcel H Wet Chemistry - Data Qualification Summary - SDG F8A260143

SDG	Sample	Analyte	Flag	A or P	Reason
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0' TSB-HR-03-10' TSB-HR-03-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HR-02-10'** TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10' TSB-HJ-11-10'	Oil & grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-02-10'**	Sulfate	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A260143	TSB-HJ-03-0' TSB-HJ-03-0'-FD	Chloride Chlorine Perchlorate	J (all detects) J (all detects) J (all detects)	А	Field duplicates (Difference)
F8A260143	TSB-HJ-03-0' TSB-HJ-03-0'-FD	Nitrate as N	J (all detects)	А	Field duplicates (RPD)
F8A260143	TSB-HJ-11-10' TSB-HJ-11-10'-FD	Perchiorate	J (all detects) UJ (all non-detects)	А	Field duplicates (Difference)

BRC Tronox Parcel H Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H Wet Chemistry - Field Blank Data Qualification Summary - SDG F8A260143

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	TSB-HR-03-0'	Sulfate	5.3U mg/Kg	Α

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A260143	TSB-HR-01-0'	Sulfate	5.5U mg/Kg	Α

SDG#	: 18356A6 #: F8A260143 atory: Test America	VA l	LIDATION		LETENE evel III/IV	SS WORKSHEE	Γ .	Date: 3/3/∘8 Page:of/ Reviewer:∨
METH Metho	I OD: (Analyte) <u>Bromide, I</u> d 300.0), Perchlorate (EF	Bromi PA Me	ne, Chlorate ethod 314.0	e, Chloride), O & G (l	, Chorine, EPA SW8	Fluoride, Nitrate, Nitrite 46 Method Z091B/ Z	-N =, Orthop PA (66	2nd Reviewer: <u>An Landing</u> hosphate-P, Sulfate (EPA VA
	amples listed below were tion findings worksheets.	revie	wed for eac	ch of the fo	ollowing va	alidation areas. Validat	ion findir	ngs are noted in attached
	Validation	Area				Com	ments	
I.	Technical holding times			A	Sampling d	ates: 1/25/08	***************************************	
lla.	Initial calibration			, A				
IIb.	Calibration verification			A				
III.	Blanks			i A				
IV	Matrix Spike/Matrix Spike Du	uplicate		SWSA	20	s huse long		
V	Duplicates			A				
VI.	Laboratory control samples			A	Lusha	50		
VII.	Sample result verification			A	Not review	ed for Level III validation.		
VIII.	Overall assessment of data			A				
IX.	Field duplicates			SW,	(4.	t) (14.15)		
L _X	Field blanks			301	R > 19			
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin FB = Fi	eld blank		D = Duplicate TB = Trip blank EB = Equipment bl	ank	
Validat	ed Samples: ** Indicates sam	ole und	lerwent Level	V validation サート	9,26,	~1 ha		
1	TSB-HJ-01-10'	114	TSB-HR-02-0	**	21_	TSB-HJ-09-0'MSD	31	
2	TSB-HJ-09-0'	12 V	TSB-HR-02-1	0'**	22	TSB-HJ-02-10'MS	32	
3	TSB-HJ-09-10'	13 ×	TSB-HJ-11-0	**	23	TSB-HJ-02-10'DUP	33	
4	TSB-HJ-03-0'	14 Y	TSB-HJ-11-1	0'	24	TSB-HJ-01-0'MS	34	
5 ¥	TSB-HJ-03-0'-FD	15 ✓	TSB-HJ-11-1	0'-FD	25	TSB-HJ-01-0'DUP	35	
6 *	TSB-HJ-03-10'	16 [¥]	TSB-HR-01-0)'	26	RINSATE-1MS /	36	
7 x	TSB-HR-03-0'	17	TSB-HR-01-1	0'	27	RINSATE-1DUP	37	
8 ~	TSB-HR-03-10'**	18 Y	TSB-HJ-01-0		28	Mrs	38	
9	TSB-HJ-02-0'**	19	RINSATE-1	As	29		39	
10	TSB-HJ-02-10'**	20	TSB-HJ-09-0	'MS	30		40	
Notes								

LDC #: [8356 Als SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1 Reviewer: 44 2nd Reviewer: 44

Method:Inorganics (EPA Method See Coper

Method:Inorganics (EPA Method		T	T	I
Validation Area	Yes	No	NA	Findings/Comments
I rectifical holding times		1.5		Absolution of the second
All technical holding times were met.	_			
Coolor temperature criteria was met.	/			
U.C. Albertion				
Were all instruments calibrated daily, each set-up time?	1	·		
Were the proper number of standards used?	1			
Were all initial calibration correlation coefficients ≥ 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)				
THE BLANK OF THE PARTY OF THE P				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
NAMabix spike Mathx spike toplicates and Dublicates 4 - 4 5 2 4 2 5 2 5 2 5 2 5 2 5 2 5 2 5 2 5				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	~			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		V		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	\checkmark			
V. Laboratory Control samples:				
Was an LCS anaylzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoverles (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC#: 18356 A6 SDG#: Lee Cover

VALIDATION FINDINGS CHECKLIST

Page: Yof Y Reviewer: MM 2nd Reviewer: MM

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification		in a de la companya d		
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	1			
VIII De Fallassos sment occida				
Overall assessment of data was found to be acceptable.	/			
Recommendates to the state of t				Ph elicate a
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	1			
AND THE PROPERTY OF THE PROPER				
Field blanks were identified in this SDG.	1			
Target analytes were detected in the field blanks.	7			

LDC #: \ 8356A6 SDG #: See Gover

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: __of__ Reviewer: __M_M_ 2nd reviewer: __M_A_

All circled methods are applicable to each sample.

		Parameter
Sample ID		
1-19	507/AZ	pH (Br Bromine Cl Chlorine F NO, NO, SO, O-PO, Chlorate) TOC (CIO) CR6+ TKN (O+G)TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
26,27	As_	pH (Br)Bromine (CI) Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC CIO ₄ CR ⁶⁺ TKN O+G/TPH
20,21	SOM	pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC (ClO) CR ⁶⁺ TKN O+G/TPH
22,23	1	pH B) Bromine CL Chlorine F NO NO SO O-PO Chlorate TOC CIO CR6+ TKN O+G/TPH
vhz	J	pH Br Bromine Cl Chloring FNO NO SO O-PO Chlorate TOC CIO, CR6+ TKN 6+GTPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
	·	pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH
		pH Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate TOC ClO ₄ CR ⁶⁺ TKN O+G/TPH

Comments:		 	

LDC #: 18356 AL SDG #: 50c CM

VALIDATION FINDINGS WORKSHEET FIELD FIELD BIANKS

Page: of Reviewer:

METHOD: Inorgan N N/A We N N/A We Blank units: We Sampling date:	METHOD: Inorganics, EPA Method N N/A Nere field blanks identified in this SDG? N N/A Were target analytes detected in the field blank units; wall associated sample units; wall sampling date; 1 x1 x 8 Soil factor applied blank type; (circle one) Field Blank / Rinsate / Other:	Were field blanks iden Were target analytes of the target analytes of target	Were field blanks identified in this SDG? Were target analytes detected in the fiel Ware target analytes detected in the fiel Associated sample units: Were target one) Field Blank / Rinsate / Other	See Covered in this SDG? detected in the field blanks? sample units: WAINS Soil factor applied	anks?	Asse	Associated Samples:	oles:	An 501-	(-	2nd Reviewer:
Analyte	Blank ID	Blank					Sample Ide	Sample Identification			
	(9	Action	4	91							
has	6,067		5.1/1.3	75/202							
`											
										,	
Blank units: Sampling date:	ate:	Associated	d sample units Soil factor s	imple units: Soil factor applied							
Field blank	Fleid blank type: (circle one) Field Blank / Rinsate	one) Field	Blank / Rins	ate / Other:		Assı	Associated Samples:	oles:			
Analyte	Blank ID	Blank					Sample Id	Sample Identification			
		Limit									
Samples with	CANCLED RESOLLIS WERE NOT QUALIFIED. Samples with analyte concentrations within five	1 OUALIFIED ations within fi	. ALL RESULT ive times the a	S NOT CIRCLE ssociated field to	D WERE QUA	LIFIED BY THE	ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: • times the associated field blank concentration are listed above, thase semple results were curefiled as not detected in	IATEMENT:	r se beijijed se	to totopoto to	
							***************************************	niple receive me	ום לתמווופת מזי	or detected, o	

LDC #: 18356 AG SDG #:

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

Reviewer: W.Z. Page:

METHOD: Inorganics, Method

Le care

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A" (V) N/A. Was a matrix spike analyzed for each matrix in this SDG?

Were matrix spike percent recoveries (%R) within the control limits of 75-125 (85-115% for Method 300.0)? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken,

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. LEVEL IV ONLY:

ıns															
Qualification	J-/47/A	T- /ut/A			, ,	\$/2m/1									
Associated Samples	A1 50;	01,4-1				123									
%R	79	44				7 /									
Analyte	0+64	705				0 + G					,		,		
Matrix	105					اءه٤									
Matrix Spike ID	ヘン					Z									
*		-	1		1	٨		·							

Comments:

LDC#: <u>18356A6</u> SDG#: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: of F Reviewer: 2nd Reviewer: 9M 2

Inorganics, Method: See Cover

YN NA YN NA

Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentrati	on (mg/Kg)				Qualification
Analyte	4	5	RPD (≤50)	Difference	Limits	(Parent only)
Chloride	4.4	0.85		3.55	(≤2.1)	J det / A
Chlorine	8.7	1.7		7	(≤4.3)	J det / A
Fluoride	0.60	0.70		0.1	(≤1.1)	
Nitrate as N	10.3	1.9	138			J det / A
Perchlorate (ug/Kg)	19.9	284		264.1	(≤42.5)	J det / A
Sulfate	92.3	87.4	5			

·	Concentrati	on (mg/Kg)				Qualification
Analyte	14	15	RPD (≤50)	Difference	Limits	(Parent only)
Chloride	10.8	8.9		1.9	(≤2.1)	
Chlorine	21.5	17.7		3.8	(≤4.3)	
Fluoride	1.3	1.7		0.4	(≤1.1)	
Nitrate as N	1.2	0.97	21			
Perchlorate (ug/Kg)	42 .7 U 27.6 Y	170		1273	(≤42.7)	J/UJ/A
Sulfate	24.4	29.1		4.7	(≤5.3)	

V:\FIELD DUPLICATES\FD_inorganic\18356A6.wpd

LDC#: \8356 Ab SDG#: \220 Com

Initial and Continuing Calibration Calculation Verification Validatin Findings Worksheet

2nd Reviewer: M & Reviewer: Page:

Method: Inorganics, Method _

__was recalculated.Calibration date:_ The correlation coefficient (r) for the calibration of ___ An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r²	r or r²	(Y/N)
Initial calibration		s1	0.2	0.033			
	ច	s2	0.5	0.075	0.9998819	0.999880	7
		83	-	0.154	,	· · ·	>
		84	2.5	0.386	•		-
		S5	2	0.794			
ストトトトルピートング ナンス Calibration verification	2003	700	9.7.48		36	86	7
न्सः ह । इपि ८०७ Calibration verification	H	٥،٠٠)	(009.7		(0)	86'00)	
$c\omega/$ Calibration verification	pos	c ·)	9'101		۲۰)	N.R.	8

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: SDG #:

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Reviewer: www Page:

METHOD: Inorganics, Method

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

Where %R = Found x 100

Found =

concentration of each analyte <u>measured</u> in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).

concentration of each analyte in the source. True == A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = $\frac{1.5 \cdot D!}{(S + D)/2} \times 100$ Where,

|| || || 0

Original sample concentration Duplicate sample concentration

					Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	%R / RPD	%R / RPD	Acceptable (Y/N)
	Laboratory control sample						
27		40	1173	0261	28	88	> -
	Matrix spike sample		(SSR-SR)				
ζ		too	2832	0110	7.)	۲۰)	
	Duplicate sample						>
۲۸		705	(>)	3	5.7	2.5	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 18316 Hb SDG #:	VALIDATION FINDING Sample Calculation		Page: of Reviewer: MH 2nd reviewer: 9MH
METHOD: Inorganics, Method	Sel com	_	
Please see qualifications below N N/A Are results with N N/A Are all detections.	v for all questions answered "N". een reported and calculated co hin the calibrated range of the in on limits below the CRQL?	Not applicable questions a rectly? struments?	re Identified as "N/A".
Compound (analyte) results fo recalculated and verified using	r (O g the following equation:	repor	rted with a positive detect were
Concentration =	Recalculation:	1.393 x 4	om_
504= Araa x ?	Ind Volument X TASING	Sout 2 1,393 x 4	tg x0,937

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#	Sample ID	Analyte	Reported Concentration (hy / ry)	Calculated Concentration	Acceptable (Y/N)
	0	u	b.7	6.7	<u> </u>
		U2	13.4	13,4	
		T	0.95	0.93	
		No3-N	0.93	0,94	
		80 4 (nx/nx)	195	795	
		504	120	120	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
		-			
				,	
-					

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Gasoline Range Organics

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Gasoline Range Organics

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10'
TSB-HJ-09-0'
TSB-HJ-09-10'
TSB-HJ-03-0'
TSB-HJ-03-10'
TSB-HR-03-10'
TSB-HR-03-10'**
TSB-HR-02-0'**
TSB-HR-02-10'**
TSB-HR-02-10'**
TSB-HR-02-10'**

TSB-HJ-01-10'MSD

TSB-HJ-02-10'MS

TSB-HJ-02-10'MSD TSB-HJ-01-0'MS

TSB-HJ-01-0'MSD

RINSATE-1MS

RINSATE-1MSD

TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10' TSB-HJ-01-0'

RINSATE-1 TSB-HJ-01-10'MS

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 24 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for all compounds were less than or equal to 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks.

Sample "RINSATE-1" was identified as a rinsate. No gasoline range organic contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel H
Gasoline Range Organics - Data Qualification Summary - SDG F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

LDC #: 18356A7	VALIDATION COMPLETENESS WORKSHEET	
SDG #:_ F8A260143	Level III/IV	
Laboratory: Test America		
		2

Date: 3/4/08
Page: /of /
Reviewer: <i>_/*</i> 7
2nd Reviewer:

METHOD: GC Gasoline Range Organics (EPA SW 846 Method 8015)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	Δ	Sampling dates: 1/25 08
lla.	Initial calibration	Δ	
IIb.	Calibration verification/ICV	Δ	101 5 15
111.	Blanks	Δ	
IVa.	Surrogate recovery	Δ	
IVb.	Matrix spike/Matrix spike duplicates	٨	
IVc.	Laboratory control samples	Δ	LCS
V.	Target compound identification	Δ.	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	Δ	Not reviewed for Level III validation.
VII.	System Performance	Δ	Not reviewed for Level III validation.
VIII.	Overall assessment of data	Δ	
IX.	Field duplicates	hb	D=H+5 14+15
X.	Field blanks	N	R- 19

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

	SOIL +	isate	Y					
1 1	TSB-HJ-01-10' ,	112	TSB-HR-02-0'**	21	TSB-HJ-01-10'MSD	31 l	8031129,	1/3
2	TSB-HJ-09-0' .	12 3	TSB-HR-02-10'** /	22 %	TSB-HJ-02-10'MS .	32 7	8035715	_ -/4
3 2	TSB-HJ-09-10' >	134	TSB-HJ-11-0'** _	23 1	TSB-HJ-02-10'MSD	33 3	8037018,	1/5
4	TSB-HJ-03-0'	14 3	TSB-HJ-11-10'	243	TSB-HJ-01-0'MS	344	8037174	216
5 2	TSB-HJ-03-0'-FD /	15	TSB-HJ-11-10'-FD	25 3	TSB-HJ-01-0'MSD	35 S	8039150	2/8
6 2	TSB-HJ-03-10' ~	163	TSB-HR-01-0' -	26 5	RINSATE-1MS ₩	36		
7 2	TSB-HR-03-0' /	17 2	TSB-HR-01-10' ✓	27 5	RINSATE-1MSD	37		
8 2	TSB-HR-03-10'** ✓	183	TSB-HJ-01-0'	28		38		
92	TSB-HJ-02-0'**	195	RINSATE-1 - W	29		39		
10 2	TSB-HJ-02-10'**	20 \	TSB-HJ-01-10'MS	30		40		

Notes:			
·	,		

LDC #: 1835647 SDG #: per coner

VALIDATION FINDINGS CHECKLIST

Page: /of 1
Reviewer: /7
2nd Reviewer: //

Method: GC HPLC

Method: GC HPLC				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	-			
Cooler temperature criteria was met.				·
11. Initial calibrations () () () () () () () () () (
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?				
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?			_	
Did the initial calibration meet the curve fit acceptance criteria?				
Were the RT windows properly established?				
IV-Continuing calibration				
What type of continuing calibration calculation was performed?%D or%R				
Was a continuing calibration analyzed daily?				
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?				
Were all the retention times within the acceptance windows?				
V. Blanks				
Was a method blank associated with every sample in this SDG?	-	-		
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		1	-	
Й Sirrogate spikes				
Were all surrogate %R within the QC limits?	4		_	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			4	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			_	
VII. Malfix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				er golfgwei ein al land an eine eine eine eine eine eine eine e
Was a MS/MSD analyzed every 20 samples of each matrix?	7			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	7		1	
/III. Laboratory control samples				
Vas an LCS analyzed for this SDG?	\Box			
Nas an LCS analyzed per extraction batch?	1		\bot	
Vere the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 9 2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control	¥4.			
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?			\	
X Target compound identification *** ********************************				
Were the retention times of reported detects within the RT windows?				
XI Compound quantitation/GRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?		_		
XII System periodical construction of the second				
System performance was found to be acceptable.		-		
All Overall assessment of data				
Overall assessment of data was found to be acceptable.				
AV. Frield duplicates				
Field duplicate pairs were identified in this SDG.	1	-		
Farget compounds were detected in the field duplicates.		7		
W. Field tolanks		-12		
ield blanks were identified in this SDG.	_	-		
arget compounds were detected in the field blanks.				

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1835BA7 SDG#: LDC #:

Initial Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

Page: 2nd Reviewer: Reviewer:

METHOD: GC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following

CF = A/C average CF = sum of the CF/number of standards %RSD = 100 * (S/X)

A ≈ Area of compound,
C = Concentration of compound,
S ≈ Standard deviation of the CF
X ≈ Mean of the CFs

1								
	: •		Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
[]	Calibration Date	Compound	CF (std)	CF (std)	Average CF (initial)	Average CF	000%	
		GR ()	रिक्षिका रिक्षिक		15699364	11 —	200 %	X.6.67
- 11								
-								
19								
		,						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated

LDC# (8350 A7 SDG#:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: 2nd Reviewer: Reviewer.

> HPLC METHOD: GC_

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below

% Difference = 100 * (ave. CF - CF)/ave. CF CF = A/C

ave. CF = initial calibration average CF Where:

CF = continuing calibration CF

A = Area of compound C = Concentration of compound

_								
				- i	Reported	Recalculated	Reported	Recalculated
	Standard ID	Calibration Date	Compound	Average CF(Ical)/	CF/Conc.	CF/Conc.	α%	Q%
_``	80/ h/e	2/4/08	GRO	7.0	0 9/93	CCA /6 0	, ,	•
7	LEALGIYIPS	Sign			3	1101	0.7	\. 5
		1160						
	Angrand	1/2 la	(,0 7					
7	G101-4-101	02/5/2	026	0.	0.9769	69160	چ. بۍ	7.3
		04:30						
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Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the

LDC #: 18 356 A7 SDG #: LL

VALIDATION FINDINGS WORKSHEET Surrogate Results Verification

of	C	3
Page:	Reviewer:	2nd reviewer

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation: BC HPLC METHOD:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found SS = Surrogate Spiked

Surrogate Surrogate Percent Percent Percent Spiked Found Recovery Recovery TTT 0.04246 100 105	Sample ID:	8	1 1 180						
- not sputing 0.0y 0.04246 106 106		Surrogate	<i>.</i>	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
not spiritude o. o despite por			45				Reported	Recalculated	
	1	14	33.1	Puting not	40.0x	0. 0424 B	90l	901	0
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Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
		-				

Sample ID:

استنا			
Percent Difference			
Percent Recovery	Recalculated		
Percent Recovery	Reported		
Surrogate Found			
Surrogate Spiked			
Column/Detector			
Surrogate			

LDC #: 18 356 A7 SDG #:

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Page: Lof Z Reviewer: 2nd Reviewer:

> HPLC METHOD:

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation: %Recovery = 100 * (SSC - SC)/SA

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

22+23

MS/MSD samples:

SC = Sample concentration

MSD = Matrix spike duplicate

د د د د د د د د د د د د د د د د د د د	S _P	Spike	Sample	Spike :	Spike Sample	Matrix	Matrix spike	Matrix Spike Duplicate	e Duplicate	MS/MSD	SD
Compound	(me	12	(mx /k/)	, y , y , y , y , y , y	Concentration (**)	Percent	Percent Recovery	Dercent			
	Osw	OSW O	D D. '	O SW	ds.	Denorted		reiceill Necovery	acovery	OAX —	- IX
Gasoline (8015)	7		Ç		-	nemodevi	Necalc.	керопед	Recalc.	Reported	Recalc.
	3	30:	2	1.04	1.04	86	36	99	99	0.38 83	<u>ာ</u>
Diesel (8015)											
Benzene (8021B)	-										
Methane (RSK-175)											
2,4-D (8151)	a*		41								
Dinoseb (8151)	1.										
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and accordance.	ike/Matrix	Spike Dupli	cates finding	s worksheet f	Jr liet of a ralif	o puo odoitoo					
of the recalculated results.				1	1000	במווחווס מווח מ	SSOCIALED SAIT	iples wnen rec	orted results	do not agree	within 10.0%

LDC #: 1835A7 SDG #: La comer

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: Of Znd Reviewer:

GC HPLC METHOD: The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

SSC = Spiked concentration SA = Spike added Where

SC = Sample concentration

LCS = Laboratory Control Sample percent recovery

LCSD = Laboratory Control Sample duplicate percent recovery

8035215-105 LCS/LCSD samples:

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100

	Spike	ke	Sample	Spike Sample	ample	רנ	rcs	TCSD	O.	TCS/FCSD	csD
Compound	Added (w/K	K KV	Conc.	Cancen (itration)	Percent !	Percent Recovery	Percent Recovery	ecovery	RPD	٥
	SOT	LCSD	0.51	SOT	CSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.0	۸	0	0.1	4 2	001	001	₩.			
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	<u> </u>	**									
2,4-D (8151)	V a	in the second se	N								
Dinoseb (8151)	t.									:	
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: Reviewer: _

V N N X METHOD:

Y N N/A	Were all recalculated results	Were all recalculated results for detected target compounds within 10% of the reported results
)	· 有後 · 安徽 · 安徽	
Concentration=	(A)(Fv)(Df)	Example:

Compound Name Concentration =_ Sample ID. A= Area or height of the compound to be measured Fv≈ Final Volume of extract Df≈ Dilution Factor RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= initial weight of the sample

			February		
#	Sample ID	Compound	Concentrations	Recalculated Results Concentrations	Qualifications
	÷				-
omments.	nts:				

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Diesel Range Organics



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 6, 2008

Matrix:

Soil/Water

Parameters:

Diesel Range Organics

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10' TSB-HJ-01-10'RE TSB-HJ-09-0' TSB-HJ-09-10' TSB-HJ-03-0' TSB-HJ-03-0'-FD TSB-HJ-03-10' TSB-HR-03-0' TSB-HR-03-10'** TSB-HJ-02-0'** TSB-HJ-02-10'** TSB-HR-02-0'** TSB-HR-02-10'** TSB-HJ-11-0'** TSB-HJ-11-10' TSB-HJ-11-10'-FD TSB-HR-01-0' TSB-HR-01-10'

TSB-HJ-01-0' RINSATE-1 TSB-HJ-01-10'MS TSB-HJ-01-10'MSD TSB-HJ-02-10'MS TSB-HJ-01-0'MS TSB-HJ-01-0'MS TSB-HJ-01-0'MSD RINSATE-1MS RINSATE-1MSD

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 25 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Diesel Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic contaminants were found in the method blanks.

Sample RINSATE-1 was identified as a rinsate. No diesel range organic contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
RINSATE-1	ortho-Terphenyl	46 (52-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	Р
TSB-HJ-01-10'	ortho-Terphenyl	71 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	Α

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-HJ-01-10'RE	ortho-Terphenyl	66 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	Α
TSB-HJ-09-0'	ortho-Terphenyl	59 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	Р
8030074-BLK	ortho-Terphenyl	51 (52-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	Р

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel H Diesel Range Organics - Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	RINSATE-1 TSB-HJ-09-0'	Diesel range organics	J- (all detects) UJ (all non-detects)	Р	Surrogate recovery (%R)
F8A260143	TSB-HJ-01-10' TSB-HJ-01-10'RE	Diesel range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel H
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Diesel Range Organics - Field Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

LDC #: 18356A8	VALIDATION COMPLETENESS WORKSHEET	Date:
SDG #: <u>F8A260143</u>	Level III/IV	Page:
Laboratory: <u>Test America</u>		Reviewer:
		2nd Reviewer

METHOD: GC Diesel Range Organics (EPA SW 846 Method 8015)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	Δ	Sampling dates: リンプログ
lla.	Initial calibration	4	
IIb.	Calibration verification/ICV	A	1CV = 15
111.	Blanks	1	
lVa.	Surrogate recovery	سی	
IVb.	Matrix spike/Matrix spike duplicates	\triangle	
IVc.	Laboratory control samples	A	LC>
V.	Target compound identification	<u> </u>	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	Δ	Not reviewed for Level III validation.
VII.	System Performance	۸	Not reviewed for Level III validation.
VIII.	Overall assessment of data	٨	
IX.	Field duplicates	ND	D=5,6 15,16
X.	Field blanks	ND	R = 20

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

D = Duplicate

FB = Field blank

TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

	901L +		مرية				
11	TSB-HJ-01-10'	111	TSB-HJ-02-10'**	21	TSB-HJ-01-10'MS	31 <i>)</i>	8031301 4/5
2 2	TSB-HJ-01-10'RE	12	TSB-HR-02-0'**	22	TSB-HJ-01-10'MSD	32 ~	8037073 2/6
3 l	TSB-HJ-09-0'	13	TSB-HR-02-10'**	23 %	TSB-HJ-02-10'MS	33 -	, 803 0074 2/,
4	TSB-HJ-09-10'	14	TSB-HJ-11-0'**	24 1 ⁄	TSB-HJ-02-10'MSD	34	
5	TSB-HJ-03-0'	T5	TSB-HJ-11-10'	25	TSB-HJ-01-0'MS	35	
62	TSB-HJ-03-0'-FD	16	TSB-HJ-11-10'-FD	26	TSB-HJ-01-0'MSD	36	
7 †	TSB-HJ-03-10'	17 1	TSB-HR-01-0'	27 3	RINSATE-1MS \N 10	37	
82	TSB-HR-03-0'	182	TSB-HR-01-10'	28 3	RINSATE-1MSD V	38	
91	TSB-HR-03-10'**	- 19 1	TSB-HJ-01-0'	29	•	39	
10	TSB-HJ-02-0'**	203	RINSATE-1	30		40	

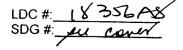
Notes:			
	,		

LDC #: 18 356 A8 SDG #: per coner

VALIDATION FINDINGS CHECKLIST

	/		
Method:_		_GC _	HPLC

wethod: GC HPLC				
Validation Area	Yes	No	NA	Findings/Comments
1. Technical holding limes				
All technical holding times were met.				
Cooler temperature criteria was met.		1		·
II. Inflial calibration	14.55	, i i i		
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	1			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		_		
Did the initial calibration meet the curve fit acceptance criteria?				
Were the RT windows properly established?	_			
IV: Continuing calibration				
What type of continuing calibration calculation was performed?%D or%R		_		
Was a continuing calibration analyzed daily?				
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?				
Were all the retention times within the acceptance windows?				e .
V:Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
Øl∕ Sumogate spikes)				
Were all surrogate %R within the QC limits?				
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
VIII Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	1			
Was a MS/MSD analyzed every 20 samples of each matrix?	7		T	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	1	-		
VIII Laboratory control samples				
Was an LCS analyzed for this SDG?			Ţ	
Was an LCS analyzed per extraction batch?	7			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				



VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: P 2nd Reviewer:

Validada	T		Т	T
Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control	Property.			
Were performance evaluation (PE) samples performed?			-	
Were the performance evaluation (PE) samples within the acceptance limits?			-	
X larger compound identification				**************************************
Were the retention times of reported detects within the RT windows?				
XI Compound quantitation/GRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	_			
XII System performance	T			Harry H. Marketter Control
System performance was found to be acceptable.		/		and the second s
(ii) Coverall assessment of data				
Overall assessment of data was found to be acceptable.		_		
div Field duplicates				
Field duplicate pairs were identified in this SDG.		-		
arget compounds were detected in the field duplicates.				
V. Field planks				
ield blanks were identified in this SDG.	7	- [I	
arget compounds were detected in the field blanks.		7		

VALIDATION FINDINDS WORKSHEET

Surrogate Recovery

2nd Reviewer: Reviewer: Page:

ပ္တ

183 SB 48

SDG #: **

METHOD: ___GC __HPLC
Are surrogates required by the method? Yes__

Are surrogates required by the method? Yes____ or No____. Please see qualifications are identified as "N/A".

Were surrogates spiked into all samples and blanks?

Did all surrogate recoveries (%R) meet the QC limits?

) #	Sample ID		Detector/ Column		Surrogate Compound		%R (Limits)	s)			Qualifications	
	02	not s	spe upica	=6	#		9뉴	53	(251-85	12	147/P	dN.
			-			-						
			->		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\)	73-	150 1	/ - [W] /A	ND
	4		-			-			(/ = 1	A/ 1/M	2
				-	7	-	9			7	` II	
	3		7		>	$\ \cdot\ $	59		()	J-/v	141/AP	άv
						-						
	8030074-BIK		->		7		3	59.	(051-65	(-(d/ In	NV
)			
)		(
)		(
))			
				1		-			Ó			
				+		\dashv)		(
				1		-)			
						_			(
				-)		(
))			
	Surrogate Compound	pur	S	Surrogate	Surrogate Compound		Surrogate Compound		Surrogate Compound	punodwo		
4	Chlorobenzene (CBZ)		9	Octa	Octacosane	Σ	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	trobenzene	Y Tetrachic	Tetrachloro-m- xylene
В	4-Bromofluorobenzene (BFB)	\dashv	I	Ortho-	Ortho-Terphenyl	z	Terphenyi-D14	Τ.	3,4-Dinitrotoluene	toluene		
O	a,a,a-Trifluorotoluene	9		Fluorobe	Fluorobenzene (FBZ)	0	Decachlorobiphenyl (DCB)	U	Tripentyltin	yltin		
٥	Bromochlorobenene	1	1	in-Tai	n-Triacontane	۵	1-methylnaphthalene	^	Tri-n-propyltin	ovitin		
ш	1,4-Dichlorobutane	1	¥	Hex	Hexacosane	σ	Dichlorophenyl Acetic Acid (DCAA)	₩ (۲	Tributyl Phosphate	osphate		
Ш	1.4-Difluorobenzene (DFB)	FB)		, Brom	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate	osphate		

LDC # [8 25648 SDG#:

Initial Calibration Calculation Verification VALIDATION FINDINGS WORKSHEET

Page: 2nd Reviewer: Reviewer:

> FLC METHOD: GC_

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following

average CF = sum of the CF/number of standards %RSD = 100 * (S/X) CF = A/C

A = Area of compound,

C = Concentration of compound, S = Standard deviation of the CF X = Mean of the CFs

Γ.	1	7	<u>, </u>	Т	7	T	T	1	T	7	7	T	7
Description		76 th (0)											
Denorted	<u> </u>	(0, 4.35)											
Recalculated	Average CF	17%											
Reported	Average CF (initial)	17265							-			·	
Recalculated	CF ((@C&td)	21951								·			
Reported	CF (1000}std)	15615	-				-						
	Compound	DRO											
	Calibration Date	30/18/1											_
	Standard ID	7											
	*	-			7			т		\parallel	4	T	\dashv

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated

LDC# 18 352 R& SDG#:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

2nd Reviewer: Page: Reviewer:

> HPLC METHOD: GC_

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF CF = A/C

Where: ave. CF = initial calibration average CF CF = continuing calibration CF A = Area of compound C = Concentration of compound

CF/Conc. "D 913-23 8-7 1047-8227 4-8					Reported	Recalculated	Reported	Recalculated
7/4/08 DRO 1000 913.23 913.23 8.7		Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	CF/Conc. CCV	CF/Conc. CCV	Q%	α %
3-1001 M22. Thol V 3012/4	ECALGOS	80/F/2	DAC	000	913.23	913.23	4.7	8.7
3-4 C22xF401 (72x. 14.8)		1						
3-1× C558 FF01 (358.7 FF01) V 30/2/2								
	ECAL 917	20/8/2	→	~	1047. K227	1047-8227	4.8	74.7
		1						
	-							
		,						

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

18350 PB LDC #: SDG#:

VALIDATION FINDINGS WORKSHEET Surrogate Results Verification

Page: __of _/ Reviewer: _____ 2nd reviewer:

> The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation: AC HPLC METHOD:

% Reçovery: SF/SS * 100

Where: SF = Surrogate Found SS = Surrogate Spiked

d Sample ID:

Surrogate Percent Percent Found Recovery Recovery 7.2. Cy 3.4 SX SX			<u> </u>				
Reported Recalculated アン・ロリシリ	Column/Detector Spri	Sur	rogate	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
75. 0434 8% Levo.11					Reported	Recalculated	
	not specified	r	28.0	45.0424	J&	<i>y</i> \$	O
	_						

Sample ID:						
Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:				-		
Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
8				Reported	Recalculated	

LDC# 1 4 356 AS coner SDG#:

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Page: Reviewer:

2nd Reviewer:

HPLC METHOD:

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using

the following calculation: %Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

2 + 1 R

MS/MSD samples:

SC = Sample concentration

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike

MSD = Matrix spike duplicate

	ďs	Spike	Sample	Spike	Spike Sample	Matrix	Matrix spike	Matrix Snike Dunicate	o Dunilcate	Work	40
Compound	A AND A	zed Zez	Conc.	Conce	Concentration	Percent 6	Percent Recovery	Percent Recovery	Secovery		200
	MS	WSD	00	O SW	OMSD	Reported	Racalc	Denote		2	11
Gasoline (8015)								neviodes	Necalc.	керопед	Kecaic.
Diesel (8015)	27.12	2%	3	1 47	1	72	7			,	•
Benzene (8021B)				. ()	3		0	9	0	5.5	ж Х,
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worl of the recalculated results.	ke/Matrix	Spike Dupl	icates findings	s worksheet f	or list of qualifi	ksheet for list of qualifications and associated samples when reported results do not agree within 10.0%	ssociated san	ples when reg	oorted results	do not agree	within 10.09

LDC # 18 356 RX SDG# to come

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: of Reviewer:

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample duplicate were recalculated for the GC HPLC METHOD:

compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

SSC = Spiked concentration SA = Spike added

SC = Sample concentration

Where

LCS = Laboratory Control Sample percent recovery

LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: < 03/30/- 105

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100

	S.	ike	Sample	Spike Sample	ample	TCS	Si	CCSD	Q	rcs/rcsd	csp
Compound	WK	Magaed (Conc.	Concent (www.	itration	Percent Recovery	tecovery	Percent Recovery	scovery	RPD	0
	SOT	Ccsp))	SOT	1	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)					-						
Diesel (8015)	83.3	なって	0	6.3	Δď	74	74	₹2			
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LCSCLCNew.wpd

10 73	Janos
1835	3
LDC #:	SDG#:

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: Reviewer: 2nd Reviewer:

HPLC METHOD:

Y N N/A Y N/N/A

Were all reported results recalculated and verified for all level IV samples? Were all recalculated results for detected target compounds, within 10% of the reported results?

(A)(Fv)(Df)	REVIVE or We Ves 21100)
Concentration=	,

Example:

Sample ID.

(Kr)(vs or Ws)(%S/100)

A= Area or height of the compound to be measured Fv= Final Volume of extract Df= Dilution Factor RF= Average response factor of the compound

In the Initial calibration

Vs= Initial volume of the sample

Ws= Initial weight of the sample

%S= Percent Solid

Concentration =

Compound Name

Sample ID Compound Concentrations Concentrations Concentrations Concentrations Concentrations	

BRC Tronox Parcel H Data Validation Reports LDC# 18356

Dioxins/Dibenzofurans



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel H

Collection Date:

January 25, 2008

LDC Report Date:

March 7, 2008

Matrix:

Soil/Water

Parameters:

Dioxins/Dibenzofurans

Validation Level:

EPA Level III & IV

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8A260143

Sample Identification

TSB-HJ-01-10'

TSB-HJ-09-0'

TSB-HJ-09-10'

TSB-HJ-03-0'

TSB-HJ-03-0'-FD

TSB-HJ-03-10'

TSB-HR-03-0'

TSB-HR-03-10'**

TSB-HJ-02-0'**

TSB-HJ-02-10'**

TSB-HR-02-0'**

TSB-HR-02-10'

TSB-HJ-11-0'

TSB-HJ-11-10'

TSB-HJ-11-10'-FD

TSB-HR-01-0'

TSB-HR-01-10'

TSB-HJ-01-0'

RINSATE-1

^{**}Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The exact mass of 380.9760 of PFK was verified. The static resolving power was at least 10,000 (10% valley definition) for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio for each target compound was greater than or equal to 2.5 and and greater than or equal to 10 for each recovery and internal standard compound for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks.

Sample RINSATE-1 was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Internal Standards	%R (Limits)	Compound	Flag	A or P
¹³ C-OCDD	38 (40-135)	OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
			13C-OCDD 38 (40-135) OCDD	13C-OCDD 38 (40-135) OCDD J (all detects) UJ (all non-detects) J (all detects)

X. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. System Performance

The system performance was acceptable for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of the report if data has been qualified.

XIV. Field Duplicates

Samples TSB-HJ-03-0' and TSB-HJ-03-0'-FD and samples TSB-HJ-11-10' and TSB-HJ-11-10'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples.

BRC Tronox Parcel H Dioxins/Dibenzofurans - Data Qualification Summary - SDG F8A260143

SDG	Sample	Compound	Flag	A or P	Reason
F8A260143	TSB-HJ-03-10'	OCDD	J (all detects) UJ (all non-detects)	Р	Internal standards (%R)
		OCDF	J (all detects) UJ (all non-detects)		

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG
F8A260143

No Sample Data Qualified in this SDG

BRC Tronox Parcel H Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG F8A260143

No Sample Data Qualified in this SDG

VALIDATION COMPLETENESS WORKSHEET LDC #: 18356A21 SDG #: F8A260143

Level III/IV

Date:	3/6/08
Page:_/	_of/
Reviewer:_	F
2nd Reviewer:_	9

Laboratory: Test America

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	4	Sampling dates: 1500
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration	Δ	
IV.	Routine calibration	Δ	
V.	Blanks	Δ	
VI.	Matrix spike/Matrix spike duplicates	N	client specified
VII.	Laboratory control samples	A	ics)
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	Δ	Not reviewed for Level III validation.
XI.	Compound quantitation and CRQLs	4	Not reviewed for Level III validation.
XII.	System performance	4	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D=4,5 14,5
XV.	Field blanks	40	R = 19

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level_IV_validation

		016	+ water				
î	TSB-HJ-01-10'	1 1 11	TSB-HR-02-0'** / /	21)	8036738 1	31	
† 2	TSB-HJ-09-0'	1 12	TSB-HR-02-10'	22 2	8037221 =	32	
# 3	TSB-HJ-09-10'	13	TSB-HJ-11-0' /	23		33	
4	TSB-HJ-03-0' ?	14	TSB-HJ-11-10' 17	24		34	
5	TSB-HJ-03-0'-FD ()	1 15	TSB-HJ-11-10'-FD D ,	25		35	
†	TSB-HJ-03-10'	, <u>1</u> 6	TSB-HR-01-0' /	26		36	
 7	TSB-HR-03-0'	17	TSB-HR-01-10' /	27		37	
8	TSB-HR-03-10'**	1 18	TSB-HJ-01-0'	28		38	
9	TSB-HJ-02-0'**	192	RINSATE-1	29		39	
_ 10	TSB-HJ-02-10'**	20		30		40	

Notes:	 			
' <u></u> ,	*			

LDC #: 1×35642) SDG #: [LU LON

VALIDATION FINDINGS CHECKLIST

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical halding times				
All technical holding times were met.				
Cooler temperature criteria was met.				
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	/			
Were the retention time windows established for all homologues?	~			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers \leq 25% ?				
Is the static resolving power at least 10,000 (10% valley definition)?				
Was the mass resolution adequately check with PFK?	/			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?				
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	/			•
Were all percent relative standard deviations (%RSD) \leq 20% for unlabeled standards and \leq 30% for labeled standards?	/			
Did all calibration standards meet the Ion Abundance Ratio criteria?	/			
Was the signal to noise ratio for each target compound \geq 2.5 and for each recovery and internal standard \geq 10?	1			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?				
Were all percent differences (%D) \leq 20% for unlabeled standards and \leq 30% for labeled standards?				
Did all routine calibration standards meet the Ion Abundance Ratio criteria?				
V. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank performed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?				
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			/	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VII, Laboratory control samples		,	_2	
Was an LCS analyzed for this SDG?				

LDC #: 18 3 Sb A2/ SDG #: Lu coner

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: 2
2nd Reviewer: 2

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	-		<u> </u>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?	<u> </u>			
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?				
Was the minimum S/N ratio of all internal standard peaks ≥ 10?				
X. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?				
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?				
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	1			
Did compound spectra contain all characteristic ions listed in the table attached?	/		!	
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	_			
Was the signal to noise ratio for each target compound and labeled standard <u>></u> 2.5?				
Does the maximum intensity of each specified characteristic ion coincide within \pm 2 seconds (includes labeled standards)?	_			
For PCDF identification, was any signal (S/N \geq 2.5, at \pm seconds RT) detected in the corresponding PCDPE channel?	_			
Was an acceptable lock mass recorded and monitored?		<u>[</u> !		
XI. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
XII; System performance				
System performance was found to be acceptable.				
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.				
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.				

LDC #: [x 356A7] SDG #: Pre coner

VALIDATION FINDINGS CHECKLIST

Page:_	/of /
Reviewer:	#7
2nd Reviewer:	

Validation Area	Yes	No	NA	Findings/Comments
Target compounds were detected in the field duplicates.				
XV: Field blanks	1			
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks.		/		

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-1CDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	g. ocob	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	1. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

VALIDATION FINDINGS WORKSHEET Internal Standards

LDC #: (8 3 SPAV)

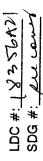
Page: __of_ 2nd Reviewer:_ Reviewer:_

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Are all internal standard recoveries were within the 40-135% criteria? Was the S/N ratio all internal standard peaks > 10? Y N N/A

				-	1	-	1	- 1		7		- 1	1			Т		T	- T	— 1			T	T	T	丁	7		〒	٦
Qualifications	1/41P	ount G. Q																			Check Standard Used									
: 40-135%)	(40-135))	()	()	()	()	()	()	(()	()	()	()	()	()	()	()	()		()	Recovery Standards		CDD							
% Recovery (Limit: 40-135%)	38																				Re	K. ¹³ C-1.2.3.4-TCDD	1 13C-1,2,3,7,8,9-HxCDD	M	2	d	<u>а</u>	d	В	
Internal Standard	13c - GI																				Check Standard Used									
Lab ID/Reference																					Internal Standards	DF	סם	PECDE	PeCDD	-HxCDF	-HxCDD	; 8-НрСDF	. 8-НрСDD	The state of the s
# Date																						A. 13C-2.3.7.8-TCDF	ᅱ	C 1378-PeCDE	D 13C-12378-PeCDD	_	F 13C-123678-HxCDD	G 13.4.6.7,8-HpCDE	+	130 0000
\leftarrow	<u> </u>		1	<u> </u>		<u> </u>	<u>i</u>	L			<u> </u>	L	<u> </u>				1	<u></u>			<u> </u>	يـــــا						1		=



VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification



METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_{\nu}/(C_{\mu})/(A_{\mu})(C_{\nu})$ average RRF = sum of the RRFs/number of standards %RSD = 100 * (S/X)

 $A_x = Area of compound,$ $A_k = C_x = Concentration of compound,$ $C_k = C_x$

 $A_{\rm k}$ = Area of associated internal standard $G_{\rm k}$ = Concentration of internal standard =s. X = Mean of the RRFs

				Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
*	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Average RRF (initial)	RRF	RRF (4 C A C)	Co a %	6
-	1021	2/1/08	2,3,7,8-TCDF (¹ C-2,3,7,8-TCDF)	Г	7///	1.12	1, 1304	20110/	Ushs,
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.244	1.244	0,0	1.3084	1,8,1	7:22
			1,2,3,6,7,8-HxCDD (19C-1,2,3,6,7,8-HxCDD)	6.974	46.0	0.95	6.9514	2.17	7.87
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.074	1.074	1.14	1/35	17.5	/73
			ocpf (%c-ocpb)	3.024	3.024	7.92	3.9348	7.77	747
~			2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)					7	
			2,3,7,8-TCDD (13C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (13O-1,2,4,6,7,8,-HpCDD)						
			OCDF (4c-ocdd)						
0			2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)						
1			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)						
			OCDF (13C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: | 83576 A2/

Routine Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: 2nd Reviewer: Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave, RRF - RAF)/ave, RRF RRF = (A_)(C_b)/(A_b)(C_c)

ave. RRF = initial calibration average RRF Where:

RRF = continuing calibration RRF

A_x = Area of compound, C = Concentration of co

$A_{\bf k}=$ Area of associated internal standard $C_{\bf k}=$ Concentration of internal standard	
$A_x = Area of compound,$ $C_x = Concentration of compound,$	

L								
					Reported	Recalculated	Reported	Recalculated
*	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	RRF (CC)	RRF (CC)		
-	07FE 08A10S	₹0/L/e	2,3,7,8-TCDF (*C-2,3,7,8-TCDF)	7".1	017	109801		0%
	181	•	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	b"C 1		17.65.7	9.1	١٠ و
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	7260	760	1.13.277	7.5	7.5
			1,2,3,4,6,7,8-HpCDD (13C-1,24,6,7,8,-HpCDD)	1041	0/:	211.0	7.0	0./
		•	(2004) 19 (2000)	1/6/	1.07	1.0/68	5.3	5,3
				3.024	3.02	3,022	Q	0
~			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)					7
			2,3,7,8-TCDD (13C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (*3C-1,2,4,6,7,8,-HpCDD)					
			OCDF (4c-ocdd)					
6			2,3,7,8-TCDF (°C-2,3,7,8-TCDF)					
T		<u> </u>	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)					
寸			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)					
寸			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)					
			OCDF (*c-ocpb)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the

LDC #: 18 252 KV SDG #: per con

Laboratory Control Sample Results Verification VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:_

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration SA = Spike added

LCS = Laboraotry control sample percent recovery

8036238 - 105 LCS ID:

RPD = ILCS - LCSD I* 2/(LCS + LCSD)

LCSD = Laboratory control sample duplicate percent recovery

	S S	ike	Spiked \$	Sample	SUI	Ş	I CSD	Q	1/8/3	08/1/80
Compound	PV (29	Added (29 /9,)	Concentration (23, 124)	tration (9)	Percent Recovery	ecovery	Percent Recovery	ecovery	, R	RPD
	S31	U LCSD	ן כ ו כא	U LCSD	Reported	Recalc	Reported	Docalo	70000	1 - 4-1::
2,3,7,8-TCDD	20.0	VA	27.5		611	11.3			National Property of the Control of	Recalcinated
1,2,3,7,8-PeCDD	100		511	_	113	113				
1,2,3,4,7,8-HxCDD	0 01		93.6		9	hb				-
1,2,3,4,7,8,9-HpCDF	Jac		107		107	107				
OCDF	000		237		\$ 11	XII				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

lons Monitored for HRGC/HRMS Analysis of PCDDs/PCDFs

Descriptor	Accurate mass ^(a)	Ol nol	Elemental Composition	Analyte	Descriptor	Accurate Mace(s)	d ad		
-	303.9016 305.8987 315.9419 317.9389 319.8965 321.8936 331.9368 333.9338 375.8364 [354.9792]	W W W W W W W W W W W W W W W W W W W	C124 350,0 C124 350,0 C125 350,0 C125 350,0 C125 350,0 C125 350,0 C125 350,0 C125 350,0 C125 350,0 C125 350,0 C125 3	TCDF TCDF (S) TCDF (S) TCDD TCDD TCDD (S) TCDD (S) HXCDPE		407.7818 409.77818 417.8250 419.8220 423.7767 425.7737 435.8169 437.8140 479.7165 [430.9728]	M M M M M M H M H M M M M M M M M M M M	C ₁₂ H ²⁶ C ₁₃ ²⁷ ClO C ₁₂ H ²⁶ C ₁₃ ²⁷ ClO ₂ C ₂ C ₁₄ ²⁸ C ₁₃ ²⁷ ClO ₂ C ₃ C ₁₄ ²⁸ C ₁₃ ²⁷ ClO ₂	Analyte HpCDF HpCDF HpCDF HpCDD HpCDD HpCDD NCOPE PFK
cu .	339,8597 341,8567 351,9000 353,8970 355,8546 357,8516 367,8949 369,8919 409,7974 [354,9792]	M M M M M M M M M M M M M M M M M M M	C ₁₂ H ₃ C ₁₄ ³ ClO C ₁₂ H ₃ Cl ₃ ³ ClO 13C ₁₂ H ₃ Cl ₃ Cl ₂ O C ₁₂ H ₃ Cl ₃ Cl ₂ O C ₁₂ H ₃ Cl ₃ Cl ₂ O C ₁₂ H ₃ Cl ₃ ClO 13C ₁₂ H ₃ Cl ₃ ClO C ₁₂ H ₃ Cl ₃ ClO	Pecder Specific Pecder Specific Pecder Pecde	ro	441.7428 443.7399 457.7377 459.7348 469.7780 471.7750 513.6775 [422.9278]	M M M M M M M M M M M M M M M M M M M	C ₁₂ ³⁶ Cl ₁ ³⁷ ClO C ₁₂ ³⁶ Cl ₁ ³⁷ ClO C ₁₂ ³⁶ Cl ₁ ³⁷ ClO ₂ C ₁₂ ³⁶ Cl ₁ ³⁷ ClO ₂ (³⁶ Cl ₁ ³⁷ ClO ₂ (³⁶ Cl ₂ ³⁷ Cl ₂ O C ₁₂ ³⁶ Cl ₃ ³⁷ Cl ₂ O C ₁₂ ³⁶ Cl ₃ ³⁷ Cl ₂ O	OCDF OCDD OCDD (S) OCDD (S) OCDD (S) PFK
ဗ	373.8208 375.8178 383.8639 385.8610 389.8156 391.8127 401.8559 403.8529 445.7555 [430.9728]	M M M M A 4 4 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4	C ₁₂ H ² Cl ₃ 7 ClO C ₁₂ H ² Cl ₃ 7 ClO C ₁₂ H ² Cl ₃ Cl ₂ O 1 ³ C ₁₂ H ² Cl ₃ O C ₁₂ H ² Cl ₃ 7 ClO ₂ C ₁₂ H ² Cl ₃ 7 ClO ₂ 1 ³ C ₁₂ H ² Cl ₃ 7 ClO ₂ 1 ³ C ₁₂ H ² Cl ₃ 7 ClO ₂ 1 ³ C ₁₂ H ² Cl ₃ 7 Cl ₂ O C ₁₂ H ² Cl ₃ 7 Cl ₂ O C ₁₂ H ² Cl ₃ 7 Cl ₂ O C ₁₂ H ² Cl ₃ 7 Cl ₂ O C ₁₂ H ² Cl ₃ 7 Cl ₂ O C ₁₂ H ² Cl ₃ 7 Cl ₂ O	HXCDF HXCDF HXCDD HXCDD HXCDD HXCDD HXCDD HXCDD HXCDD HXCDD SOCDFE OCCDFE OCCDFE					

The following nuclidic masses were used:

₫

H = 1.007825 C = 12.000000 ¹³C = 13.003355 F = 18.9984

O = 15.994915 $^{36}Cl = 34.968853$ $^{37}Cl = 36.965903$

S = internal/recovery standard

LDC #:	18356A2	•
SDG #:	'pre con	

only.

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:_	
Reviewer:	ħ
2nd reviewer:	Q

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

/		1	
/	Υ	N	N/A
	Y/	N	N/A
	7		

Were all reported results recalculated and verified for all level IV samples?
Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentr	ation	= $(A_{s})(I_{s})(DF)$ $(A_{s})(RRF)(V_{o})(\%S)$
A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
l _s	=	Amount of internal standard added in nanograms (ng)
V_{\circ}	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
RRF	=	Relative Response Factor (average) from the initial calibration
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices

Example:
Sample I.D. #
Conc. = (2853900 (2000) ()) () () () () () () ()
= 3.9 pg/g

				,	
#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Qualification
	184				
					<u> </u>

LDC #:_	
CDC #	

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification (additional page)

Page:_	of
Reviewer:	