LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

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

February 20, 2008

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed is the revised data validation reports for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

SDG#	LDC#	Fraction
TRNC-D-4	18100D1	Volatiles

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

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

February 11, 2008

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the revised data validation reports for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

SDG#	LDC#	Fraction
TRNC-D-2	18100B1	Volatiles
TRNC-D-3	18100C1	Volatiles
TRNC-D-4	18100D1	Volatiles
TRNC-D-5	18100E1	Volatiles
TRNC-D-6	18100F1	Volatiles
TRNC-D-7	18100G1	Volatiles

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

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

February 8, 2008

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed is the revised data validation report for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

SDG#	LDC#	Fraction
TRNC-D-6	18100F1	Volatiles
TRNC-D-7	18100G1	Volatiles
TRNC-D-3	18100C4	Metals

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

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

February 6, 2008

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on January 8, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18100:

SDG #	Fraction
TRNC-D-1, TRNC-D-2, TRNC-D-3, TRNC-D-4, TRNC-D-5, TRNC-D-6, TRNC-D-7	Volatiles, Semivolatiles, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Wet Chemistry, Gasoline Range Organics, Diesel Range Organics, Dioxins/Dibenzofurans

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
- 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

55,798 Pages-CD

Attachment 1

80/20

LDC #18100 (ERM-Sacramento / BRC Tronox Parcel C/D/F/G)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		SVOA (8270C)		Pest. (8081A)		PCBs (8082)		Metals (SW846)		GRO (8015)		DRO (8015)		Dioxins (8290)		Bromide Bromine Chlorate		Chloride Chloride Fluoride		NO_3 NO_2 O-OP_4		CLO_4 (314.0)		O&G (9071B)									
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	TRNC-D-1	01/08/08	01/29/08	4	11	1	11	1	18	-	-	1	11	1	11	1	11	1	11	1	11	1	11	1	11	1	11	0	11								
B	TRNC-D-2	01/08/08	01/29/08	1	12	0	10	0	13	-	-	0	10	0	9	0	10	0	7	0	10	0	10	0	10	0	10	0	10								
B	TRNC-D-2	01/08/08	01/29/08	0	6	0	6	0	8	-	-	0	6	0	7	0	6	0	9	0	6	0	6	0	6	0	6	0	6								
C	TRNC-D-3	01/08/08	01/29/08	5	17	1	17	1	20	-	-	1	17	1	30	1	17	0	17	1	17	1	17	1	17	1	17	1	17								
D	TRNC-D-4	01/08/08	01/29/08	3	19	0	16	0	19	-	-	0	16	0	27	0	16	0	16	0	16	0	16	0	16	0	16	0	16								
E	TRNC-D-5	01/08/08	01/29/08	5	0	1	0	1	0	1	6	1	0	2	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0								
E	TRNC-D-5	01/08/08	01/29/08	0	17	0	16	0	22	0	3	0	16	0	25	0	16	0	9	0	16	0	16	0	16	0	16	0	16								
F	TRNC-D-6	01/08/08	01/29/08	5	16	1	15	1	31	1	5	1	15	1	25	1	15	1	8	1	15	1	15	1	15	1	15	1	15								
G	TRNC-D-7	01/08/08	01/29/08	5	14	1	14	0	17	-	-	1	14	1	21	1	14	0	8	1	14	1	14	1	14	1	14	1	14								
Total	T/LR			28	112	5	105	4	148	2	14	5	105	6	155	5	105	4	85	5	105	5	105	5	105	5	105	4	105	0	0	0	0	0	0	0	1437

Shaded cells indicate Level IV validation (all other cells are Level IIII validation). These sample counts do not include MS/MSD, and DUPs

18100ST.wpd

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

Volatiles

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 24, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TRIP BLANK
TB1
TB2
TSB-CJ-04-0'MS
TSB-CJ-04-0'MSD

Introduction

This data review covers 13 soil samples and 4 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.

Raw data were not reviewed for this SDG. The review was 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.

All samples were received in good condition with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TB1 TB2	All TCL compounds	A headspace was apparent in the sample containers.	There should be no headspace in the sample containers.	J- (all detects) UJ (all non-detects)	A

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
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥0.05) 0.04730 (≥0.05)	All soil samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥0.05)	All soil samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A
11/16/07	Ethanol	0.00331 (≥0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A

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
11/17/07 (FCAL7971)	Trichlorofluoromethane	27.11258	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-04-0'MS TSB-CJ-04-0'MSD 7322075MB	J+ (all detects)	A
11/18/07 (FCAL7996)	Acetonitrile	38.20584	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB	J+ (all detects)	A
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-1	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/19/07 (FCAL8041)	Chloromethane Acetonitrile	27.59986 40.91991	TSB-CJ-08-0' 7324674MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-1	J+ (all detects)	A

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
11/17/07 (FCAL7971)	Acetonitrile	0.01102 (≥0.05)	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-04-0'MS TSB-CJ-04-0'MSD 7322075MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7996)	Acetonitrile	0.01288 (≥0.05)	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7997)	Ethanol	0.00180 (≥0.05)	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6872)	Ethanol	0.00314 (≥0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥0.05) 0.04404 (≥0.05) 0.04664 (≥0.05) 0.03391 (≥0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/19/07 (FCAL8041)	Acetonitrile	0.01313 (≥0.05)	TSB-CJ-08-0' 7324674MB	J (all detects) UJ (all non-detects)	A
11/19/07 (FCAL8042)	Ethanol	0.00142 (≥0.05)	TSB-CJ-08-0' 7324674MB	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
7322075MB	11/17/07	Toluene 1,2,4-Trimethylbenzene	1.3 ug/Kg 0.36 ug/Kg	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10'
7323521MB	11/18/07	Toluene 1,2,4-Trimethylbenzene	0.55 ug/Kg 0.42 ug/Kg	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'
7324674MB	11/19/07	1,2,4-Trimethylbenzene	0.45 ug/Kg	TSB-CJ-08-0'

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-CR-07-0'	1,2,4-Trimethylbenzene	0.45 ug/Kg	5.0U ug/Kg
TSB-CR-07-10'	1,2,4-Trimethylbenzene	0.53 ug/Kg	5.5U ug/Kg
TSB-CJ-08-0'-FD	1,2,4-Trimethylbenzene	0.55 ug/Kg	5.2U ug/Kg
TSB-CJ-08-10'	1,2,4-Trimethylbenzene	0.50 ug/Kg	5.4U ug/Kg
TSB-CJ-04-10'	1,2,4-Trimethylbenzene	0.51 ug/Kg	5.4U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-CJ-07-0'	1,2,4-Trimethylbenzene	0.54 ug/Kg	5.2U ug/Kg
TSB-CJ-07-10'	1,2,4-Trimethylbenzene	0.50 ug/Kg	5.6U ug/Kg
TSB-CJ-03-0'	1,2,4-Trimethylbenzene	0.44 ug/Kg	5.3U ug/Kg
TSB-CJ-03-10'	1,2,4-Trimethylbenzene	0.50 ug/Kg	5.4U ug/Kg
TSB-CJ-08-0'	1,2,4-Trimethylbenzene	0.61 ug/Kg	5.2U ug/Kg

Samples TRIP BLANK, TB1, and TB2 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	11/9/07	Dichloromethane Acetone	0.86 ug/L 1.5 ug/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' RINSATE 1
TB1	11/9/07	Dichloromethane	1.2 ug/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' RINSATE 1

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB2	11/9/07	Dichloromethane	0.81 ug/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' RINSATE 1

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

Rinsate ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE 1	11/9/07	Styrene	0.34 ug/L	All soil samples in SDG TRNC-D-1

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-CR-07-10'	Acetone	7.0 ug/Kg	22U ug/Kg
TSB-CJ-07-10'	Acetone	9.1 ug/Kg	22U ug/Kg
TSB-CJ-03-10'	Acetone	9.6 ug/Kg	21U 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.

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 relative percent differences (RPD) were not within QC limits for some compounds, the MS/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. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7323521LCS (TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB)	Vinyl acetate	167 (56-115)	-	-	J+ (all detects)	P
7324674LCS (TSB-CJ-08-0' 7324674)	Vinyl acetate	161 (56-115)	-	-	J+ (all detects)	P
7325161LCS/D (All water samples in SDG TRNC-D-1)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
1,2,4-Trimethylbenzene	0.61	0.55	-	0.06 (≤5.2)	-	-

BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TB1 TB2	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Sample condition (headspace)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10'	Trichlorofluoromethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-08-0'	Chloromethane Acetonitrile	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10'	Acetonitrile	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-1	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' TSB-CJ-08-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-1	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' TSB-CJ-08-0'	Vinyl acetate	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-1	TSB-CR-07-0'	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-1	TSB-CR-07-10'	1,2,4-Trimethylbenzene	5.5U ug/Kg	A
TRNC-D-1	TSB-CJ-08-0'-FD	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-1	TSB-CJ-08-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-1	TSB-CJ-04-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-1	TSB-CJ-07-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-1	TSB-CJ-07-10'	1,2,4-Trimethylbenzene	5.6U ug/Kg	A
TRNC-D-1	TSB-CJ-03-0'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-1	TSB-CJ-03-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-1	TSB-CJ-08-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-1	TSB-CR-07-10'	Acetone	22U ug/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Acetone	22U ug/Kg	A
TRNC-D-1	TSB-CJ-03-10'	Acetone	21U ug/Kg	A

LDC #: 18100A1
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/15/08
Page: 1 of 1
Reviewer: CF
2nd Reviewer: [signature]

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
I.	Technical holding times	SW	Sampling dates: 11/9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. Y2
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3+4.
XVII.	Field blanks	SW	R=12. TB=13.14.15

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:

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21	732207SMB	31	
2	TSB-CR-07-10'	12	RINSATE 1	22	732352MB	32	
3	TSB-CJ-08-0'	13	TRIP BLANK	23	732467MB	33	
4	TSB-CJ-08-0'-FD	14	TB1	24	732576MB (W)	34	
5	TSB-CJ-08-10'	15	TB2	25		35	
6	TSB-CJ-04-0'	16	TSB-CJ-04-0'MS	26		36	
7	TSB-CJ-04-10'	17	TSB-CJ-04-0'MSD	27		37	
8	TSB-CJ-07-0'	18		28		38	
9	TSB-CJ-07-10'	19		29		39	
10	TSB-CJ-03-0'	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. 2-Nitropropane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. p-Cymene
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Iodomethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
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	TTTT.
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.

LDC #: 18100A1
SDG #: RNC-D-1

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: Q
2nd Reviewer: L

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
14-15	W	headspace					Y/N/A

TECHNICAL HOLDING TIME CRITERIA

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

LDC #: 18100A1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: 4
2nd Reviewer: 1

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".

(Y) N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
(Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
(Y) N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
(Y) N N/A Did the initial calibration meet the acceptance criteria?
Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/13/07	ICAL	EEEE		0.00932	MM Soils 732207 SMB	√ / UJ / A
		(F)	NN		0.04730	732352 MB	√
						732467 MB	
	11/17/07	ICAL	WWW		0.00164	↓	√ / UJ / A
		(F)					
	11/16/07	ICAL	PP		0.04881	MM Hg Pb, 732516 MB	√ / UJ / A
		(L)	MM		0.03735		
			PPPP		0.03359		↓
	11/16/07	ICAL	WWW		0.00331	↓	√ / UJ / A
		(L)					

INICAL.1SB

LDC #: 18100A1
SDG #: See COVR

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: A
2nd Reviewer: 1

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

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

~~Y~~ N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

~~Y~~ N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y ~~N~~ N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	LICV6847 (ICV)	No nanal	32.75684		MH=0s T325161MB	√+dets / B
	11/17/07	FCAL7971	HK	27.11258		1-2.4-7.16-17	√+dets / B
			EEEE		0.01102	732207SMB	√/M+ / A
	11/18/07	FCAL7996	EEEE	38.20584		8-11.732352MB	√+dets / A
			EEEE		0.01288		√/M+ / A
	11/18/07	FCAL7997	WWW		0.00180		↓
	11/19/07	~~LCAL6873~~ CAL	WWW		0.00314 ~~0.00298~~	MH=0s	√/M+ / A
	11/19/07	LCAL6874	B	31.45374		T325T61MB	√+dets / B
			PPPP		0.02835		√/M+ / A
			PP		0.04404		↓
			RR		0.04664		
			MM		0.03391		
	11/19/07	FCAL8041	A	27.59986		3.732474MB	√+dets / A
			EEEE	40.91991			↓
			EEEE		0.01313		√/M+ / A
	11/19/07	FCAL8042	WWW		0.00142		↓

LDC #: 18100A1
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: A
2nd Reviewer: L

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".

(Y) N N/A Was a method blank associated with every sample in this SDG?
(Y) N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
(Y) N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/17/07
Conc. units: ug/kg
Associated Samples: 1-3, 4-7

Compound	Blank ID	Sample Identification								
	73220/5MB	1	2	4	5	6	7			
Methylene chloride										
Acetone										
CC	1.3									
DDD	0.36	0.45/5.0U	0.53/5.5U	0.55/5.3U	0.50/5.4U	(2)	0.51/5.4U			
CRQL										

Blank analysis date: 11/18/07
Conc. units: ug/kg
Associated Samples: 8-11

Compound	Blank ID	Sample Identification								
	73235/1MB	8	9	10	11					
Methylene chloride										
Acetone										
CC	0.55									
DDD	0.42	0.54/5.2U	0.50/5.6U	0.44/5.3U	0.50/5.4U					
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100A1
SDG #: JRNC-D-1

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: [illegible]

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".

(Y) N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/19/07
Conc. units: µg/kg
Associated Samples: 3

Compound	Blank ID	Sample Identification								
	7324674MB3	3								
Methylene chloride										
Acetone										
DDD	0.45	0.61 J U								
CRQL										

Blank analysis date: _____
Conc. units: _____
Associated Samples: _____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100A1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 6 of 7
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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: ug/L **Associated sample units:** ug/kg
Sampling date: 11/9/07
Field blank type: (circle one) Field Blank / (Rinsate) / Trip Blank / Other:_____ Associated Samples: All soils (ND)

Compound	Blank ID	Sample Identification								
	12									
Methylene chloride										
Acetone										
Chloroform										
FF	0.34									
CRQL										

Blank units: ug/L **Associated sample units:** ug/L / ug/kg
Sampling date: 11/9/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ Associated Samples: 1-12

Compound	Blank ID	Blank ID	Blank ID	Sample Identification						
	13	14	15	2	6	9	11			
~~Methylene chloride~~ Dichloromethane	0.86	x 1.2	0.81							
Acetone	1.5			7.0/22 U	(100)	9.1/22U	9.6/~~22~~ 21U			
Chloroform										
CRQL										

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 #: 18100A1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Q
2nd Reviewer: L

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".

[✓ 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.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A 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	Qualifications
		16/17	RPD out several (cpds)			( )	6	No qual
				( )	( )	( )		(%R in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 18100A1
SDG #: SecCom

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [signature]

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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7322075LCS/D	HH	155 (56-115)	165 (56-115)	( )	1-2.4-7.	No Cmpd
				( )	( )	( )	7322075MB	(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		7323521LCS	HH	167 (56-115)	( )	( )	8-11, 7323521MB	√+dets/AP
			NN	146 (65-135)	( )	( )		No Cmpd (MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		7324674LCS	HH	161 (56-115)	( )	( )	3, 7324674MB	√+dets/AP
				( )	( )	( )		
				( )	( )	( )		
		7325161LCS/D	B	150 (38-140)	144 (38-140)	( )		√+dets/P
			P	( )	( )	21 (≤20)	all w/o 3 Blk	No Cmpd
			F	( )	( )	24 ( )		
			NN	( )	( )	34 ( )		↓
				( )	( )	( )		(%R in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100A1
SDG #: TRNC-0-1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: Q
2nd reviewer:

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/kg)		D ~~RPD~~
	3	4	
DDD	0.61	0.55	0.06 ($\leq 5.^2$) No qual

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-0'DL
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-0'-FDDL
TSB-CJ-06-10'
TB
TSB-CR-01-0'MS
TSB-CR-01-0'MSD
TSB-CJ-06-0'MS
TSB-CJ-06-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 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 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
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-2	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acetonitrile	0.00932 (≥0.05)	TSB-CJ-02-0'** TSB-CJ-02-10'**	J (all detects) UJ (all non-detects)	A
	Methyl ethyl ketone	0.04730 (≥0.05)	TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7323521MB 7324674MB	J (all detects) UJ (all non-detects)	
11/17/07	Ethanol	0.00164 (≥0.05)	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7323521MB 7324674MB	J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-2	J+ (all detects)	A
11/19/07 (FCAL8041)	Chloromethane Acetonitrile	27.59986 40.91991	TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7324674MB	J+ (all detects) J+ (all detects)	A
11/18/07 (FCAL7996)	Acetonitrile	38.20584	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7323521MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-2	J+ (all detects)	A

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
11/19/07 (LCAL6873)	Ethanol	0.00314 (≥0.05)	All water samples in SDG TRNC-D-2	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥0.05) 0.04881 (≥0.05) 0.04664 (≥0.05) 0.03391 (≥0.05)	All water samples in SDG TRNC-D-2	J (all detects) UJ (all non-detects)	A
11/19/07 (FCAL8041)	Acetonitrile	0.01313 (≥0.05)	TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7324674MB	J (all detects) UJ (all non-detects)	A
11/19/07 (FCAL8042)	Ethanol	0.00142 (≥0.05)	TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7324674MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7996)	Acetonitrile	0.01288 (≥0.05)	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7323521MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7997)	Ethanol	0.00180 (≥0.05)	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7323521MB	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
7330403MB	11/25/07	Acetone	8.0 ug/Kg	TSB-CR-01-0'DL TSB-CJ-06-0'-FDDL
7323521MB	11/18/07	Toluene 1,2,4-Trimethylbenzene	0.55 ug/Kg 0.42 ug/Kg	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0'
7324674MB	11/19/07	1,2,4-Trimethylbenzene	0.45 ug/Kg	TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'

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-CR-01-0'DL (5x)	Acetone	320 ug/Kg	320U ug/Kg
TSB-CJ-06-0'-FDDL (5x)	Acetone	260 ug/Kg	260U ug/Kg
TSB-CJ-02-0'**	1,2,4-Trimethylbenzene	0.45 ug/Kg	5.3U ug/Kg
TSB-CJ-02-10'**	1,2,4-Trimethylbenzene	0.47 ug/Kg	5.2U ug/Kg
TSB-CJ-01-0'**	1,2,4-Trimethylbenzene	0.40 ug/Kg	5.2U ug/Kg
TSB-CJ-01-10'**	1,2,4-Trimethylbenzene	0.54 ug/Kg	5.3U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-CJ-01-0'-FD**	1,2,4-Trimethylbenzene	0.55 ug/Kg	5.2U ug/Kg
TSB-CR-02-0'**	1,2,4-Trimethylbenzene	0.54 ug/Kg	5.1U ug/Kg
TSB-CR-02-10'	1,2,4-Trimethylbenzene	0.49 ug/Kg	5.3U ug/Kg
TSB-CR-01-10'	1,2,4-Trimethylbenzene	0.41 ug/Kg	5.2U ug/Kg
TSB-CR-03-0'	1,2,4-Trimethylbenzene	0.72 ug/Kg	5.1U ug/Kg
TSB-CR-03-10'	1,2,4-Trimethylbenzene	0.46 ug/Kg	5.2U ug/Kg
TSB-CJ-05-0'	1,2,4-Trimethylbenzene	0.55 ug/Kg	5.2U ug/Kg
TSB-CJ-05-10'	1,2,4-Trimethylbenzene	0.52 ug/Kg	5.4U ug/Kg
TSB-CJ-06-0'	1,2,4-Trimethylbenzene	1.3 ug/Kg	5.1U ug/Kg
TSB-CJ-06-10'	1,2,4-Trimethylbenzene	0.60 ug/Kg	5.7U ug/Kg

Sample "TB" was identified as a trip blank. No volatile contaminants were found in this blank with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB	11/12/07	Dichloromethane	0.79 ug/L	All soil samples in SDG TRNC-D-2

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.

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 with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-CR-01-0'MS/MSD (TSB-CR-01-0')	Vinyl acetate	1.4 (10-150)	0.0 (10-150)	200 (≤20)	J (all detects) UJ (all non-detects)	A
TSB-CJ-06-0'MS/MSD (TSB-CJ-06-0')	Vinyl acetate	0.0 (10-150)	0.0 (10-150)	-	J- (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)

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

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7323521LCS (TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0' 7323521MB)	Vinyl acetate	167 (56-115)	-	-	J+ (all detects)	P
7324674LCS (TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' 7324674MB)	Vinyl acetate	161 (56-115)	-	-	J+ (all detects)	P
7325161LCS/D (All water samples in SDG TRNC-D-2)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P

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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CR-01-0' TSB-CJ-06-0'-FD	Acetone	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

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

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

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-CJ-01-0'** and TSB-CJ-01-0'-FD**, samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD, and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FDDL were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
1,2,4-Trimethylbenzene	0.40	0.55	-	0.15 ug/Kg (≤5.2)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Acetone	40	310	-	270 ug/Kg (≤20)	J (all detects)	A
1,2,4-Trimethylbenzene	1.3	3.4	-	2.1 ug/Kg (≤5.1)	-	-
m,p-Xylenes	0.87	1.5	-	0.63 ug/Kg (≤5.1)	-	-
1,3,5-Trimethylbenzene	5.1U	1.2	-	3.9 ug/Kg (≤5.1)	-	-
Xylenes, total	10U	1.5	-	8.5 ug/Kg (≤10)	-	-
Methyl ethyl ketone	20U	11	-	9 ug/Kg (≤20)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FDDL				
Acetone	40	260	-	220 ug/Kg (≤20)	J (all detects)	

*BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
*TRNC-D-2	TB	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-2	TB	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Chloromethane Acetonitrile	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TB	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-2	TB	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-2	TSB-CR-01-0'	Vinyl acetate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)(RPD)
TRNC-D-2	TSB-CJ-06-0'	Vinyl acetate	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-01-0' TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Vinyl acetate	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-2	TB	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-2	TSB-CR-01-0' TSB-CJ-06-0'-FD	Acetone	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-0'-FDDL	Acetone	J (all detects)	A	Field duplicates (Difference)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-2	TSB-CR-01-0'DL (5x)	Acetone	320U ug/Kg	A
TRNC-D-2	TSB-CJ-06-0'-FDDL (5x)	Acetone	260U ug/Kg	A
TRNC-D-2	TSB-CJ-02-0'**	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-2	TSB-CJ-02-10'**	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-01-0'**	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-01-10'**	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-2	TSB-CJ-01-0'-FD**	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CR-02-0'**	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-2	TSB-CR-02-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-2	TSB-CR-01-10'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CR-03-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-2	TSB-CR-03-10'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-05-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-05-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-2	TSB-CJ-06-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-2	TSB-CJ-06-10'	1,2,4-Trimethylbenzene	5.7U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B1
SDG #: TRNC-D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/23/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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
I.	Technical holding times	A	Sampling dates: 11/12/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. 12
IV.	Continuing calibration/ICV	SW	RF ≤ 25/0
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	SW	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3+5. 15+16. 15+17
XVII.	Field blanks	SW	TB=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

1	1	TSB-CJ-02-0'**	S	11	2	TSB-CR-03-0'	S	21	1	TSB-CR-01-0'MSD	S	31	1	T32752MB
2	1	TSB-CJ-02-10'**		12	2	TSB-CR-03-10'		22	2	TSB-CJ-06-0'MS		32	2	T32464MB
3	1	TSB-CJ-01-0'**		13	2	TSB-CJ-05-0'		23	D	TSB-CJ-06-0'MSD		33	3	T32516MB W
4	1	TSB-CJ-01-10'**		14	2	TSB-CJ-05-10'		24				34	4	T33040MB
5	2	TSB-CJ-01-0'-FD**		15	2	TSB-CJ-06-0'		25				35		
6	2	TSB-CR-02-0'**		16	2	TSB-CJ-06-0'-FD		26				36		
7	2	TSB-CR-02-10'		17	4	TSB-CJ-06-0'-FDDL		27				37		
8	1	TSB-CR-01-0'		18	2	TSB-CJ-06-10'		28				38		
9	4	TSB-CR-01-0'DL		19	3	TB	W	29				39		
10	2	TSB-CR-01-10'		20	1	TSB-CR-01-0'MS	S	30				40		

LDC #: 18100B1
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: V

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
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 $\geq$ 0.990?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) > 0.05?		✓		
IV. Continuing calibration				
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) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?		✓		
V. Blanks				
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.	✓			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. 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.	✓			
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?	✓			

LDC #: 18100B1
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
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?			✓	
X. Internal standards				
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?	✓			
XI. Target compound identification				
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?	✓			
XII. 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?	✓			
XIII. Tentatively identified compounds (TICs)				
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 required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Dichloromethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Nonanal
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Dimethyl Disulfide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. 2-Nitropropane
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	TTTT.
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.

LDC #: 15100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: R
2nd Reviewer: L

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~~ N/A — Did the laboratory perform a 5 point calibration prior to sample analysis?
~~N~~ N/A — Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
~~N~~ N/A — Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
~~N~~ N/A — Did the initial calibration meet the acceptance criteria?
Y ~~N~~ N/A — Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICAL	~~PP~~		0.04881	MH-01, T3516MB	J / UJ / A
		(L)	MM		0.03735		
			~~PPP~~ NNNW		0.03359		
	11/16/07	ICAL	WWW		0.00331		
		(L)					
	11/13/07	ICAL	~~EEE~~		0.00932	~~MH-01~~ 1-8, 10-16	J / UJ / A
		(F)	NN		0.04730	18, 20-23	
	11/17/07	~~X~~ ICAL	WWW		0.00164	T3235MB	
						T3246T4MB	

INICAL1SB

LDC #: 13100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer:

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICV6847 (ICV)	Nonanal	32.7568		MW20s, T3516MB	J+ dets/A
	11/19/07	CAL6813	WWW		0.00314	MW20s. T3576MB	J/UJ/A
		CAL6814	NNNN		0.02835		
			PP		0.04881		
			RR		0.04664		
			MM		0.03391		
			B	31.4534			J+ dets/A
	11/19/07	FCAL8041	A	20.59986		5-7.10-16.18	J+ dets/A
			EEEE	40.91991		22-23	
			ZZZZ		0.01313	T3546MB	J/UJ/A
	11/19/07	FCAL8042	WWW		0.00142		
	11/18/07	FCAL7996	EEEE	38.20584		1-4, 8, 20-21	J+ dets/A
			ZZZZ		0.01288	T3523MB	J/UJ/A
	11/18/07	FCAL7997	WWW		0.00180		

LDC #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/25/07
Conc. units: ug/kg
Associated Samples: 9.17

Compound	Blank ID	Sample Identification								
	7330403MB		9(5)	17(5)						
Methylene chloride										
Acetone	8.0		320/U	260/U						
CRQL										

Blank analysis date:
Conc. units:
Associated Samples:

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/18/07
Conc. units: ug/kg
Associated Samples: 1-4. 8

Compound	Blank ID	Sample Identification								
	732352/MB	1	2	3	4	8				
Methylene chloride										
Acetone										
CC	0.55									
DDD	0.42	0.45/5.3U	0.47/5.3U	0.40/5.2U	0.54/5.3U	(4.5)				
CRQL										

Blank analysis date: 11/19/07
Conc. units: ug/kg
Associated Samples: 5-7. 10-16. 18

Compound	Blank ID	Sample Identification										
	732474MB	5	6	7	10	11	12	13	14	15	16	18
Methylene chloride												
Acetone												
DDD	0.45	0.55/5.2U	0.54/5.1U	0.49/5.3U	0.41/5.2U	0.72/5.1U	0.46/5.2U	0.55/5.2U	0.59/5.4U	1.3/5.1U	(3.4)	0.60/5.1U
CRQL												

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100B1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer:

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

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: ug/L **Associated sample units:** ug/Kg
Sampling date: 11/13/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples: all soils

Compound	Blank ID	Sample Identification								
	19									
Methylene chloride										
Acetone										
Chloroform										
0000	0.79									
CRQL										

Blank units:_____ **Associated sample units:**_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
Chloroform										
CRQL										

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 #: 18100B1
SDG #: 3a cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
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".

(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.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A 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	Qualifications
		20/21	HH	1.4 (10-150)	0.0 (10-150)	200 (≤20)	8	J/UJ/A
			%R and RPD out	for some cpds	( )			No Cert'd (CCS in)
				( )	( )	( )		
				( )	( )	( )		
		22/23	HH	0.0 (10-150)	0.0 (10-150)	( )	15	J-/UJ/A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 18008B1
SDG #: 500COILV

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	P	T323521LCS	NN	146 (65-135)	( )	( )	1-4.8.	No qual (MSin)
			HH	167 (56-115)	( )	( )	T323521MB	J+ dets/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		T3246T4LCS	HH	161 (56-115)	( )	( )	5-7.10-16.18	J+ dets/P
				( )	( )	( )	T3246T4MB	
				( )	( )	( )		
		T323561LCS/D	B	150 (38-140)	144 (38-140)	( )	All 10 S	J+ dets/P
			D	( )	( )	21 (≤20)	T323561MB	No qual
			F	( )	( )	24 ( )		
			NN	( )	( )	34 ( )		(LCSD %R in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: h

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".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		8, 16	F > calib range	8, 16	J+ (all detects) / A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100B1
SDG #: 5acover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: a.
2nd reviewer: L

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		D RPD
	3	5	
DDD	0.40	0.55	0.15 (≤5.) No Qual

Compound	Concentration (ug/kg)		D RPD
	15	16	
F	40	310	270 (≤20) √ dets/A
DDD	1.3	3.4	2.1 (≤5.1) No Qual
RRR	0.8T	1.5	0.63
AAA	5.1 U	1.2	3.9
GG	10 U	1.5	8.5 (≤10)
NN	20 U	11	9 (≤20)

Compound	Concentration (ug/kg)		D RPD
	15	17	
F	40	260	220 (≤20) √ dets/A

Compound	Concentration ( )		RPD

LDC #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: L

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:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
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
X = Mean of the RRFs

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL2	11/13/07	S (1st internal standard)	0.28500	0.28500	0.29152	0.29152	10.9T2T	10.9T
			CC (2nd internal standard)	0.95833	0.95833	0.9T869	0.9T869	T.2T3T4	T.2T3T
			DDD (3rd internal standard)	3.47698	3.47698	3.48429	3.48429	8.95185	8.9518
2	ICAL	11/17/07	WWW (1st internal standard)	0.00153	0.00153	0.00164	0.00164	9.10389	8.98899
			XXXX (2nd internal standard)	0.52462	0.52462	0.52212	0.52212	15.80940	15.8092
			OOO (3rd internal standard)	1.25801	1.25801	1.3409T	1.3409T	9.49562	9.49560
3			(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 #: 18100B1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: 1

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	FCAL1996	11/18/07	S (1st internal standard)	0.29152	0.30124	0.30124	3.3352	3.3337
			CC (2nd internal standard)	0.97869	1.05751	1.05751	8.0537	8.054
			DDD (3rd internal standard)	3.48429	3.66238	3.66238	5.11109	5.11113
2	FCAL1997	11/18/07	WWW (1st internal standard)	0.00164	0.00180	0.00180	9.5T365	9.9146
			QQQQ (2nd internal standard)	0.52212	0.56625	0.55625	6.53695	6.5368
			OOO (3rd internal standard)	1.3409T	1.35015	1.35015	0.68492	0.6846
3	FCAL8041	11/19/07	S (1st internal standard)	0.29152	0.31477	0.31477	T.9T691	T.9771
			CC (2nd internal standard)	0.97869	1.06868	1.06868	9.19513	9.1954
			DDD (3rd internal standard)	3.48429	3.77160	3.77160	8.2459	8.2460
4	FCAL8042	11/19/07	WWW (1st internal standard)	0.00164	0.00142	0.00142	13.4742	13.4634
			QQQQ (2nd internal standard)	0.52212	0.53185	0.53185	1.86303	1.8629
			OOO (3rd internal standard)	1.34097	1.23034	1.23034	8.2495	8.2498

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 #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: q
2nd reviewer:

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	50	42.0880	84	84	0
Bromofluorobenzene	↓	41.7257	81	81	↓
1,2-Dichloroethane-d4		48.7276	97	97	
Dibromofluoromethane		46.2516	93	93	✓

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					
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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 #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 9

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

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 = | MSC - MSDC | * 2/(MSC + MSDC)

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

MS/MSD sample: 20/21

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	51.0	50.9	ND	50.0	35.7	98	98	TO	TO	33	33
Trichloroethene				48.6	32.4	95	95	64	64	40	40
Benzene				49.1	34.1	96	96	67	67	36	36
Toluene				46.2	31.1	91	91	61	61	39	39
Chlorobenzene	↓	↓	↓	45.7	30.0	90	90	59	59	42	42

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 #: 18100B1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory 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 = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 732352

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	50	NA	52.5	NA	105	105				
Trichloroethene	↓	↓	49.8	↓	100	100				
Benzene			52.0		104	104				
Toluene			52.9		106	106				
Chlorobenzene			51.2		102	102				

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 #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: LA

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

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

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

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

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

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

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 2 . DDD:

Conc. = $\frac{(3147)(50)(5)(1)}{(1006\text{TP})(34829)(4.98)(0.955)}$

= 0.47 µg/kg

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

TSB-DR-06-0'	RINSTATE-2
TSB-DR-06-10'	TB-1RINSATE
TSB-DR-05-0'	TSB-DR-03-0'MS
TSB-DR-05-0'-FD	TSB-DR-03-0'MSD
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
TB1-11-13-07	
TB2-11-13-07	
TB3-11-13-07	

Introduction

This data review covers 19 soil samples and 5 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.

Raw data were not reviewed for this SDG. The review was 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
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥0.05) 0.04730 (≥0.05)	All soil samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥0.05)	All soil samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/19/07 (FCAL8041)	Chloromethane Acetonitrile	27.59986 40.91991	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB	J+ (all detects) J+ (all detects)	A
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-3	J+ (all detects)	A
11/25/07 (FCAL8262)	Nonanal	26.02663	TSB-CR-05-10' TSB-CR-06-10' 7330403MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-3	J+ (all detects)	A

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
11/19/07 (FCAL8041)	Acetonitrile	0.01313 (≥0.05)	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/19/07 (FCAL8042)	Ethanol	0.00142 (≥0.05)	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6872)	Ethanol	0.00314 (≥0.05)	All water samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥0.05) 0.04881 (≥0.05) 0.04664 (≥0.05) 0.03391 (≥0.05)	All water samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8261)	Ethanol	0.00138 (≥0.05)	TSB-CR-05-10' TSB-CR-06-10' 7330403MB	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8262)	Acetonitrile	0.01063 (≥0.05)	TSB-CR-05-10' TSB-CR-06-10' 7330403MB	J (all detects) UJ (all non-detects)	A
11/20/07 (FCAL8096)	Acetonitrile Methyl ethyl ketone	0.01136 (≥0.05) 0.04919 (≥0.05)	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0' TSB-DR-03-0'MS TSB-DR-03-0'MSD 7325351MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/20/07 (FCAL8097)	Ethanol	0.00143 (≥0.05)	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0' TSB-DR-03-0'MS TSB-DR-03-0'MSD 7325351MB	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
7324674MB	11/19/07	1,2,4-Trimethylbenzene	0.45 ug/Kg	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10'
7325351MB	11/20/07	1,2,4-Trimethylbenzene	0.40 ug/Kg	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0'
7330403MB	11/25/07	Acetone Toluene	8.0 ug/Kg 1.1 ug/Kg	TSB-CR-05-10' TSB-CR-06-10'

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-DR-06-0'	1,2,4-Trimethylbenzene	0.52 ug/Kg	5.0U ug/Kg
TSB-DR-06-10'	1,2,4-Trimethylbenzene	0.49 ug/Kg	5.3U ug/Kg
TSB-DR-05-0'	1,2,4-Trimethylbenzene	0.63 ug/Kg	5.1U ug/Kg
TSB-DR-05-0'-FD	1,2,4-Trimethylbenzene	1.7 ug/Kg	5.0U ug/Kg
TSB-DR-05-10'	1,2,4-Trimethylbenzene	0.44 ug/Kg	5.5U ug/Kg
TSB-DR-03-0'	1,2,4-Trimethylbenzene	0.33 ug/Kg	5.1U ug/Kg
TSB-DR-03-10'	1,2,4-Trimethylbenzene	0.44 ug/Kg	5.3U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-DJ-01-0'	1,2,4-Trimethylbenzene	0.37 ug/Kg	5.2U ug/Kg
TSB-DJ-01-10'	1,2,4-Trimethylbenzene	0.31 ug/Kg	5.3U ug/Kg
TSB-DR-04-0'	1,2,4-Trimethylbenzene	0.33 ug/Kg	5.1U ug/Kg
TSB-DR-04-10'	1,2,4-Trimethylbenzene	0.29 ug/Kg	5.3U ug/Kg
TSB-CR-04-0'	1,2,4-Trimethylbenzene	0.40 ug/Kg	5.0U ug/Kg
TSB-CR-04-10'	1,2,4-Trimethylbenzene	0.32 ug/Kg	5.6U ug/Kg
TSB-CR-06-0'	1,2,4-Trimethylbenzene	0.91 ug/Kg	5.1U ug/Kg

Samples TB-1RINSATE, TB1-11-13-07, TB2-11-13-07, and TB3-11-13-07 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
TB-1RINSATE	11/13/07	Dichloromethane	0.77 ug/L	RINSTATE-2
TB1-11-13-07	11/13/07	Dichloromethane	0.83 ug/L	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10'
TB3-11-13-07	11/13/07	Dichloromethane	0.75 ug/L	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10'

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB2-11-13-07	11/13/07	Acetone Dichloromethane	1.6 ug/L 0.88 ug/L	TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'

Sample "RINSATE-2" was identified as a rinsate. No volatile contaminants were found in this blank.

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-CR-06-0'	Acetone	9.7 ug/Kg	21U 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.

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) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7324674LCS (TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB)	Vinyl acetate	161 (56-115)	-	-	J+ (all detects)	P
7325161LCS/D (All water samples in SDG TRNC-D-3)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P
7325351LCS (TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0' 7325351MB)	Vinyl acetate	171 (56-115)	-	-	J+ (all detects)	P

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

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Acetone	11	20U		9 (≤20)	-	-
1,2,4-Trimethylbenzene	0.63	1.7	-	1.07 (≤5.0)	-	-
Toluene	5.1U	0.51	-	4.59 (≤5.1)	-	-
1,3,5-Trimethylbenzene	5.1U	0.29	-	4.81 (≤5.1)	-	-
m,p-Xylenes	5.1U	1.1	-	4.0 (≤5.1)	-	-

*BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Flag	A or P	Reason
*TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10'	Chloromethane Acetonitrile	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-3	TSB-CR-05-10' TSB-CR-06-10'	Nonanal	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-CR-05-10' TSB-CR-06-10'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-3	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0'	Vinyl acetate	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-06-0'	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-3	TSB-DR-06-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-DR-05-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-3	TSB-DR-05-0'-FD	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-3	TSB-DR-05-10'	1,2,4-Trimethylbenzene	5.5U ug/Kg	A
TRNC-D-3	TSB-DR-03-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-3	TSB-DR-03-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-DJ-01-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-3	TSB-DJ-01-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-DR-04-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-3	TSB-DR-04-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-CR-04-0'	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-3	TSB-CR-04-10'	1,2,4-Trimethylbenzene	5.6U ug/Kg	A
TRNC-D-3	TSB-CR-06-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-3	TSB-CR-06-0'	Acetone	21U ug/Kg	A

LDC #: 18100C1
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: Q
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
I.	Technical holding times	A	Sampling dates: 11/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. 12
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A-SW	
XVI.	Field duplicates	SW	D = 3+4.
XVII.	Field blanks	SW	R = 21*. TB = 22, 18. 19. 20

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:

1	TSB-DR-06-0'	S	11	TSB-DR-04-10'	S	21	RINSTATE-2	W	31	732467AMB	S
2	TSB-DR-06-~~40~~ 10'		12	TSB-CR-04-0'		22	TB-1RINSATE		32	T325761MB	W
3	TSB-DR-05-0'		13	TSB-CR-04-10'		23	TSB-DR-03-0'MS	S	33	T325351MB	S
4	TSB-DR-05-0'-FD		14	TSB-CR-05-0'		24	TSB-DR-03-0'MSD		34	T330403MB	
5	TSB-DR-05-10'		15	TSB-CR-05-10'		25			35		
6	TSB-DR-03-0'		16	TSB-CR-06-0'		26			36		
7	TSB-DR-03-10'		17	TSB-CR-06-10'		27			37		
8	TSB-DJ-01-0'		18	TB1-11-13-07	W	28			38		
9	TSB-DJ-01-10'		19	TB2-11-13-07		29			39		
10	TSB-DR-04-0'		20	TB3-11-13-07		30			40		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Dichloromethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Nonanal
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Dimethyl Disulfide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. 2-Nitropropane
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	TTTT.
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.

LDC #: 18100C1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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) N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
(N) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
(N) N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? _____
(Y) N N/A Did the initial calibration meet the acceptance criteria?
Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	1 CAL	~~PP~~		0.04881	MH-01s,	J- / UX / A
		(L)	MM		0.03735	732576MB	
			~~PPP~~ NNNN		0.03359		
	11/16/07	1 CAL	WWW		0.00331		
		(L)					
	11/13/07	1 CAL	ZZZZ		0.00932	MH-01s, 732457MB	J- / UX / A
		(F)	NN		0.04730	732535MB	
	11/17/07	01 CAL	WWW		0.00164	733403MB	

INICAL.1SB

LDC #: 18100C1
SDG # See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 4
2nd Reviewer:

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICV68247 (ICV)	Nonanal	32.75682		MW20, 7325761MB	√ + dets / A
	11/19/07	FCAL8041	A	27.59986		1-5. 7326741MB	√ + dets / A
			EEEE	40.91991			√
			EEEE		0.01313		√ / MW / A
	11/19/07	FCAL8042	WWW		0.00142		√
	11/19/07	LCAL68721	WWW		0.00314	MW20s	√ / MW / N
	11/19/07	LCAL6874	B	31.45374		7325161MB	√ + dets / A
			NNNN		0.02835		√ / MW / A
			PP		0.04881		
			RR		0.04661		√
			MM		0.03391		
	11/25/07 √	FCAL8061	WWW		0.00138	15:17.7330403MB	√ / MW / A
		FCAL8062	Nonanal	26.02663			A + dets / A
			EEEE		0.01063		√ / MW / A
	11/26/07	FCAL8096	EEEE		0.01136	6-14.16.33-24	√ / MW / A
			NN		0.04919	7325351MB	√
	11/20/07	FCAL8097	WWW		0.00143		√

LDC #: 18100c1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: Q
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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/19/07
Conc. units: ug/kg
Associated Samples: 1 - 5

Compound	Blank ID	Sample Identification								
73467MB	1	2	3	4	5				
Methylene chloride										
Acetone										
DDD	0.45	0.52/5.0U	0.49/5.3U	0.63/5.1U	1.7/5.0U	0.44/5U				
CRQL										

Blank analysis date: 11/20/07
Conc. units: ug/kg
Associated Samples: 6 - 14, 16

Compound	Blank ID	Sample Identification								
73535MB	6	7	8	9	10	11	12	13	16
Methylene chloride										
Acetone										
DDD	0.40	0.33/5.1U	0.44/5.3U	0.37/5.2U	0.31/5.3U	0.33/5.1U	0.29/5.3U	0.40/5.0U	0.32/5.6U	0.91/5.1U
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100C1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: [illegible]

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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/25/07
Conc. units: ug/Kg
Associated Samples: 15, 17

Compound	Blank ID	Sample Identification								
73Bd03MB										
Methylene chloride										
Acetone	8.0									
CC	1.1									
CRQL										

Blank analysis date: _____
Conc. units: _____
Associated Samples: _____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100C1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1a

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

(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: ug/L Associated sample units: ug/kg
Sampling date: 11/13/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ Associated Samples: ~~B~~ 21

Compound	Blank ID	Sample Identification								
	22									
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.77									
CRQL										

Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/13/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ Associated Samples: 1 - 11

Compound	Blank ID	Blank ID	Sample Identification							
	18	20								
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.83	0.75								
CRQL										

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 #: 18100c1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

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

(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: ug/L Associated sample units: ug/Kg
Sampling date: 11/23/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ Associated Samples: 12-17

Compound	Blank ID	Sample Identification									
	19	16									
Methylene chloride											
Acetone	1.6	9.7/21/4									
Chloroform											
Dichloromethane	0.88										
CRQL											

Blank units:_____ Associated sample units:_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification									
Methylene chloride											
Acetone											
Chloroform											
CRQL											

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 #: 18100C1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T324674 LCS	HH	161 (56-115)	( )	( )	1-5. T324674 MB	J+ detects/P
				( )	( )	( )		
				( )	( )	( )		
		T325161 LCS/D	B	150 (38-140)	144 (38-140)	( )	all HCDs	J+ detects/P
			D	( )	( )	21 (≤20)	T325161 & MB	No Qual
			T-	( )	( )	24 ( )		↓
			NN	( )	( )	34 ( )		
				( )	( )	( )		(70 R in)
				( )	( )	( )		
		T325335 LCS	HH	171 (56-115)	( )	( )	6-14. 16.	J+ detects/P
				( )	( )	( )	T325335 MB	
				( )	( )	( )		
				( )	( )	( )		
		T330403 LCS/D	HH	151 (56-115)	152 (56-115)	( )	15. T330403 MB	No Qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18160C1
SDG #: Sea Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: L

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/kg) 3	4	RPD	
F	11	20 U	9	(≤20)
DDD	0.63	1.7	1.07	(≤50)
~~EE~~ CC	5.1 U	0.51	4.59	(≤50)
AAA	↓	0.29	4.81	↓
RRR	↓	1.1	4.0	↓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: March 26, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-0'DL
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-0'-FDDL
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-0'DL
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'
TB-2-11-14-07
TB-1-11-14-07
TB-3-11-14-07
TSB-FJ-06-10'MS
TSB-FJ-06-10'MSD

Introduction

This data review covers 21 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 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-06-0'-FDDL TSB-DR-01-0'DL	Acetone	16	14	J- (all detects) UJ (all non-detects)	A

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
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-4	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acetonitrile	0.00932 (≥0.05)	TSB-FR-01-0' TSB-FR-01-10'	J (all detects) UJ (all non-detects)	A
	Methyl ethyl ketone	0.04730 (≥0.05)	TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' TSB-FJ-06-10'MS TSB-FJ-06-10'MSD 7329017MB	J (all detects) UJ (all non-detects)	
11/17/07	Ethanol	0.00164 (≥0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' TSB-FJ-06-10'MS TSB-FJ-06-10'MSD 7329017MB	J (all detects) UJ (all non-detects)	A

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
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-4	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-4	J+ (all detects)	A

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
11/19/07 (LCAL6873)	Ethanol	0.00314 (≥0.05)	All water samples in SDG TRNC-D-4	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥0.05) 0.04881 (≥0.05) 0.04664 (≥0.05) 0.03391 (≥0.05)	All water samples in SDG TRNC-D-4	J (all detects) UJ (all non-detects)	A
11/24/07 (FCAL821)	Acetonitrile Methyl ethyl ketone	0.01083 (≥0.05) 0.04379 (≥0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7329017MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/24/07 (FCAL8209)	Ethanol	0.00141 (≥0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7329017MB	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
7329017MB	11/24/07	Methyl ethyl ketone	1.5 ug/Kg	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'
7330403MB	11/25/07	Acetone	8.0 ug/Kg	TSB-FJ-07-0'DL
7333515MB	11/30/07	Acetone	920 ug/Kg	TSB-FJ-06-0'-FDDL TSB-DR-01-0'DL

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-FJ-07-0'	Methyl ethyl ketone	7.5 ug/Kg	22U ug/Kg
TSB-FJ-06-0'-FD	Methyl ethyl ketone	15 ug/Kg	20U ug/Kg
TSB-DR-01-0'	Methyl ethyl ketone	3.0 ug/Kg	20U ug/Kg
JB-NW-DITCH01-0'	Methyl ethyl ketone	7.0 ug/Kg	21U ug/Kg
TSB-FJ-07-0'DL (2.5x)	Acetone	190 ug/Kg	190U ug/Kg
TSB-FJ-06-0'-FDDL (50x)	Acetone	400 ug/Kg	1000U ug/Kg

Samples TB-2-11-14-07, TB-1-11-14-07, and TB-3-11-14-07 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
TB-2-11-14-07	11/14/07	Dichloromethane	0.94 ug/L	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-0'DL TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-0'-FDDL TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10'
TB-1-11-14-07	11/14/07	Dichloromethane	0.90 ug/L	TSB-DR-01-0' TSB-DR-01-0'DL TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'
TB-3-11-14-07	11/14/07	Dichloromethane	0.79 ug/L	All soil samples in SDG TRNC-D-4

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-DR-02-0'	Dichloromethane	3.6 ug/Kg	5.0U 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.

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) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7325161LCS (All water samples in SDG TRNC-D-4)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FJ-07-0' TSB-FJ-06-0'-FD TSB-DR-01-0'	Acetone	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD, samples TSB-FJ-06-0' and TSB-FJ-06-0'-FDDL, and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
*Acetone	21U	480	-	474.8 ug/Kg (≤21)	J (all detects) UJ (all non-detects)	A
Ethylbenzene	5.2U	0.41	-	4.79 ug/Kg (≤5.2)	-	-
2-Hexanone	21U	7.1	-	13.9 ug/Kg (≤21)	-	-
Toluene	5.2U	0.47	-	4.73 ug/Kg (≤5.2)	-	-
1,2,4-Trimethylbenzene	5.2U	3.2	-	2 ug/Kg (≤5.2)	-	-
1,3,5-Trimethylbenzene	5.2U	1.1	-	4.1 ug/Kg (≤5.2)	-	-
o-Xylene	5.2U	0.83	-	4.37 ug/Kg (≤5.2)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Xylenes, total	10U	2.8	-	7.2 ug/Kg (≤10)	-	-
m,p-Xylenes	5.2U	2.0	-	3.2 ug/Kg (≤5.2)	-	-
Methyl ethyl ketone	21U	15	-	6 ug/Kg (≤21)	-	-

*Corrected the Concentration result and Difference (Limit) for Acetone in the above table.

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FDDL				
*Acetone	21U	400	-	394.8 ug/Kg (≤21)	J (all detects) UJ (all non-detects)	A

*Corrected the Concentration result and Difference (Limit) for Acetone in the above table.

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Acetone	13	20U	-	7 ug/Kg (≤20)	-	-
Dichloromethane	3.6	5.1U	-	1.5 ug/Kg (≤5.1)	-	-

BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FJ-06-0'-FDDL TSB-DR-01-0'DL	Acetone	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-4	TSB-FJ-07-0' TSB-FJ-06-0'-FD TSB-DR-01-0'	Acetone	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-0'-FDDL	Acetone	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-4	TSB-FJ-07-0'	Methyl ethyl ketone	22U ug/Kg	A
TRNC-D-4	TSB-FJ-06-0'-FD	Methyl ethyl ketone	20U ug/Kg	A
TRNC-D-4	TSB-DR-01-0'	Methyl ethyl ketone	20U ug/Kg	A
TRNC-D-4	JB-NW-DITCH01-0'	Methyl ethyl ketone	21U ug/Kg	A
TRNC-D-4	TSB-FJ-07-0'DL (2.5x)	Acetone	190U ug/Kg	A
TRNC-D-4	TSB-FJ-06-0'-FDDL (50x)	Acetone	1000U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-4	TSB-DR-02-0'	Dichloromethane	5.0U ug/Kg	A

LDC #: 18100D1
SDG #: TRNC-D-4
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

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2nd Reviewer: [illegible]

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
I.	Technical holding times	A/SW	Sampling dates: 11/14/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A/SW	RSD. r²
IV.	Continuing calibration/ICV	A/SW	ICV 2570
V.	Blanks	A/SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A/SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	A/N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	A/SW	D = 6+7. 6+8. 15+17.
XVII.	Field blanks	A/SW	TB=20. 21. 22.

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:
All Soils Except # 20 - 22

1	TSB-FR-01-0'	1	11	TSB-FJ-05-10'	1	21	TB-1-11-14-07	W	31	T325161MB
2	TSB-FR-01-10'	1	12	TSB-DR-01-0'	2	22	TB-3-11-14-07	W	32	T329017MB S
3	TSB-FJ-07-0'	1	13	TSB-DR-01-0'DL	2	23	TSB-FJ-06-10'MS	S	33	7330403MB F
4	TSB-FJ-07-0'DL	1	14	TSB-DR-01-10'	2	24	TSB-FJ-06-10'MSD	W	34	7333515MB F
5	TSB-FJ-07-10'	1	15	TSB-DR-02-0'	2	25			35	
6	TSB-FJ-06-0'	1	16	TSB-DR-02-10'	2	26			36	
7	TSB-FJ-06-0'-FD	1	17	TSB-DR-02-0'-FD	2	27			37	
8	TSB-FJ-06-0'-FDDL	1	18	JB-NW-DITCH01-0'	2	28			38	
9	TSB-FJ-06-10'	1	19	JB-NW-DITCH01-10'	2	29			39	
10	TSB-FJ-05-0'	1	20	TB-2-11-14-07	W	30			40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Dichloromethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Nonanal
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Dimethyl Disulfide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. 2-Nitropropane
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	TTTT.
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.

LDC #: 18100D1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
8	S	X	11-14-07	NA	11-30-07	16	J/UJ/A
13	↓	↓	↓	↓	11-30-07	↓	↓
							(F)

TECHNICAL HOLDING TIME CRITERIA

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

LDC #: 18100B1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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2nd Reviewer: [illegible]

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".

60 N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICAL (L)	~~PP~~ MM		0.04881 0.03735	MW1-21, 732516MB	J / UJ / A
			~~PPPP~~ NNNN		0.13359		
	11/16/07	ICAL (L)	WWW		0.00331		
	11/13/07	ICAL (F)	~~EEE~~ NN		0.00932 0.04730	MW soils except 4.8, 13.	J / UJ / A
	11/17/07	DICAL	WWW		0.00164	732901TMB	

INICAL.1SB

LDC #: 18100D1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICV6847 (ICV)	Nonanal	32.7568		MW-20, T3516 MB	J+ detects/A
	11/19/07	CCAL6873	WWW		0.00314		J/MW/A
	↓	CCAL6877	B	31.4537			J+ detects/A
			NNNN		0.02835		J/MW/A
			PP		0.0488		
			RR		0.04664		
			MM		0.03391		
	11/24/07	FCAL8211	EEEE		0.01083	1-3.5-7.9-12	J/MW/A
			NN		0.04379	14-19.	↓
	11/24/07	FCAL8209	WWW		0.00147	T3290 TMB	J/MW/10

LDC #: 18100D7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

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2nd Reviewer: [illegible]

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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/24/07
Conc. units: ug/Kg

Associated Samples: 1-3, 5-7, 9-12, 14-19

Compound	Blank ID	Sample Identification								
7732917MB	7732917MB	3	7	12	18					
Methylene chloride										
Acetone										
NA	1.5	7.5/22U	15/20U	3.0/20U	7.0/21U					
CRQL										

Blank analysis date: 11/25/07
Conc. units: ug/Kg

Associated Samples: 2, 13, 4

Compound	Blank ID	Sample Identification								
7732403MB	7732403MB	2 (2.5x)	13							
Methylene chloride										
Acetone	8.0	190/U								
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100D1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

(Y) N N/A Was a method blank associated with every sample in this SDG?
(Y) N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
(Y) N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/30/07
Conc. units: ug/kg
Associated Samples: 8, 13

Compound	Blank ID	Sample Identification								
75335754B	75335754B	8 (50X)								
Methylene chloride										
Acetone	920	400/1000U								
CRQL										

Blank analysis date:
Conc. units:
Associated Samples:

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100D1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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

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: ug/L Associated sample units: ug/kg
Sampling date: 11/14/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: 1-11

Compound	Blank ID	Sample Identification								
	20									
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.94									
CRQL										

Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/14/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: 12-19

Compound	Blank ID	Sample Identification								
	21	14/15								
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.90	3.6/5.0U								
CRQL										

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 #: 18000/
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 1
2nd Reviewer: 6

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

(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: ug/L Associated sample units: ug/kg
Sampling date: 11/14/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ Associated Samples: all soils

Compound	Blank ID	Sample Identification								
	22	475								
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.79	3.6/5.0U								
CRQL										

Blank units:_____ Associated sample units:_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
Chloroform										
CRQL										

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 #: 18100D1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T325761LCS/D	B	150 (38-140)	144 (38-140)	( )	All Soils	J+ (all) / J
			D	( )	( )	21 (≤20)	T325T61MB	No Qual
			F	( )	( )	24 ( )		
			NN	( )	( )	34 ( )		↓
				( )	( )	( )		
		T3901TLCS/D	HH	154 (56-115)	154 (56-115)	( )	1-3, 5-7, 9-12.	No Qual
				( )	( )	( )	14-19.	(MS/MSD in
				( )	( )	( )	T3901TMB	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100D1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: Q
2nd Reviewer: [illegible]

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".

Y N (N/A) Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N (N/A) Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		3, 7, 12	F > calib range	3, 7, 12	J dets / A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100D2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer:

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/kg)		D RPD
	6	7	
F	5.2 U	480	474.8 (≤5.2) J/U/D
ZZ	↓	0.41	4.79 ↓ No Qual
Z	21 U	7.1	13.9 (≤21)
CC	5.2 U	0.47	4.73 (≤5.2)
DDD		3.2	2
AAA		1.1	4.1

Compound	Concentration ( )		RPD
SSS		0.83	4.37
GG	10 U	2.8	7.2 (≤10)
RRR	5.2 U	2.0	3.2 (≤5.2)
NN	21 U	15	6 (≤21)

Compound	Concentration (µg/kg)		D RPD
	6	8	
F	5.2 U	400	394.8 (≤5.2) J/U/D

Compound	Concentration (µg/kg)		D RPD
	15	17	No Qual
F	13	20 U	7 (≤20) No Qual
Dichloromethane	3.6	5.1 U	1.5 (≤5.1) No Qual

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

TSB-FJ-03-0'**	RINSATE-3
TSB-FJ-03-0'-FD**	TB-4-11-15-07
TSB-FJ-03-10'**	TSB-FJ-10-0'MS
TSB-FJ-10-0'**	TSB-FJ-10-0'MSD
TSB-FJ-10-0'DL**	TSB-FR-02-0'MS
TSB-FJ-10-10'**	TSB-FR-02-0'MSD
TSB-FJ-04-0'**	
TSB-FJ-04-10'**	
TSB-FJ-02-0'**	
TSB-FJ-02-0'-FD**	
TSB-FJ-02-10'**	
TSB-FR-02-0'**	
TSB-FR-02-10'**	
TSB-FJ-09-0'**	
TSB-FJ-09-10'**	
TSB-FR-03-0'**	
TSB-FR-03-10'**	
TB-01-11-15-07	
TB-02-11-15-07	
TB-03-11-15-07	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 21 soil samples and 5 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD	All TCL compounds	15	14	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-10'**	All TCL compounds	15	14	J- (all detects) UJ (all non-detects)	P

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
*11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-5	J (all detects) UJ (all non-detects)	A
11/13/07	Acetonitrile Methyl ethyl ketone Ethanol	0.00932 (≥0.05) 0.04730 (≥0.05) 0.00164 (≥0.05)	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7333508MB 7335121MB 7330403MB	J (all detects) UJ (all non-detects)	A
11/29/07	Acetonitrile 2-Nitropropane	0.00365 (≥0.05) 0.04718 (≥0.05)	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/19/07 (LCAL6874)	Bromomethane	31.45374	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB	J+ (all detects)	A
11/20/07 (LCAL6902)	Bromomethane Iodomethane Methyl ethyl ketone	64.95744 85.21601 188	TB-4-11-15-07 7329018MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/29/07 (FCAL8464)	Dichloromethane Acetone Acetonitrile	27.78400 28.94367 33.03338	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** 7333508MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/30/07 (FCAL8500)	Dichloromethane Acetonitrile Nonanal	32.20394 52.78688 28.28801	TSB-FR-03-10'** 7335121MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/25/07 (FCAL8262)	Nonanal	26.02663	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7330403MB	J+ (all detects)	A
11/30/07 (GCAL9455)	Iodomethane Nonanal	50.38991 33.50982	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-5	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/29/07 (GICV9430)	Iodomethane Vinyl acetate Nonanal	39.14797 40.79661 227	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	J+ (all detects) J+ (all detects) J+ (all detects)	A

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
11/19/07 (LCAL6873)	Ethanol	0.00314 (≥0.05)	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥0.05) 0.04881 (≥0.05) 0.04664 (≥0.05) 0.03391 (≥0.05)	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB	J (all detects) UJ (all non-detects)	A
11/20/07 (LCAL6902)	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.04492 (≥0.05) 0.04910 (≥0.05) 0.03949 (≥0.05)	TB-4-11-15-07 7329018MB	J (all detects) UJ (all non-detects)	A
11/20/07 (LCAL6901)	Ethanol	0.00354 (≥0.05)	TB-4-11-15-07 7329018MB	J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8464)	Acetonitrile Methyl ethyl ketone	0.01239 (≥0.05) 0.04487 (≥0.05)	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** 7333508MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8465)	Ethanol	0.00145 (≥0.05)	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** 7333508MB	J (all detects) UJ (all non-detects)	A
11/30/07 (FCAL8500)	Acetonitrile	0.01423 (≥0.05)	TSB-FR-03-10'** 7335121MB	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/30/07 (FCAL8501)	Ethanol	0.00164 (≥0.05)	TSB-FR-03-10'** 7335121MB	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8261)	Ethanol	0.00138 (≥0.05)	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7330403MB	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8262)	Acetonitrile	0.01063 (≥0.05)	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7330403MB	J (all detects) UJ (all non-detects)	A
11/30/07 (GCAL9455)	Acetonitrile 2-Nitropropane	0.00407 (≥0.05) 0.04674 (≥0.05)	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	J (all detects) UJ (all non-detects) 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
7333515MB	11/30/07	Acetone 2-Hexanone Dichloromethane 1,2,4-Trimethylbenzene	920 ug/Kg 580 ug/Kg 71 ug/Kg 34 ug/Kg	TSB-FJ-10-0'DL**
7330403MB	11/25/07	Acetone Toluene	8.0 ug/Kg 1.1 ug/Kg	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FR-02-0'**

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
7333508MB	11/29/07	Acetone Dichloromethane Toluene	5.6 ug/Kg 5.6 ug/Kg 0.85 ug/Kg	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'**

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-FJ-10-0'DL** (50x)	2-Hexanone Dichloromethane	240 ug/Kg 96 ug/Kg	1100U ug/Kg 270U ug/Kg
TSB-FJ-03-0'**	Toluene	0.61 ug/Kg	5.2U ug/Kg
TSB-FJ-03-0'-FD**	Toluene	0.57 ug/Kg	5.3U ug/Kg
TSB-FJ-03-10'**	Toluene	0.51 ug/Kg	5.4U ug/Kg
TSB-FJ-10-0'**	Toluene	1.7 ug/Kg	5.3U ug/Kg
TSB-FJ-10-10'**	Toluene	0.67 ug/Kg	5.2U ug/Kg
TSB-FJ-04-0'**	Toluene	0.80 ug/Kg	5.2U ug/Kg
TSB-FR-02-0'**	Acetone Toluene	64 ug/Kg 0.78 ug/Kg	64U ug/Kg 5.1U ug/Kg
TSB-FJ-02-0'-FD**	Acetone Dichloromethane	6.2 ug/Kg 6.3 ug/Kg	21U ug/Kg 6.3U ug/Kg
TSB-FJ-02-10'**	Acetone Dichloromethane	12 ug/Kg 7.6 ug/Kg	22U ug/Kg 7.6U ug/Kg
TSB-FJ-02-0'**	Acetone Dichloromethane	15 ug/Kg 7.4 ug/Kg	21U ug/Kg 7.4U ug/Kg
TSB-FR-02-10'**	Acetone Dichloromethane	17 ug/Kg 7.0 ug/Kg	22U ug/Kg 7.0U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-FJ-09-0'**	Acetone Dichloromethane	13 ug/Kg 6.4 ug/Kg	21U ug/Kg 6.4U ug/Kg
TSB-FJ-09-10'**	Acetone Dichloromethane	15 ug/Kg 7.5 ug/Kg	22U ug/Kg 7.5U ug/Kg
TSB-FR-03-0'**	Acetone Dichloromethane	22 ug/Kg 6.7 ug/Kg	22U ug/Kg 6.7U ug/Kg

Samples TB-01-11-15-07, TB-02-11-15-07, TB-03-11-15-07, and TB-4-11-15-07 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
TB-01-11-15-07	11/15/07	Dichloromethane	0.87 ug/L	All soil samples in SDG TRNC-D-5
TB-02-11-15-07	11/15/07	Dichloromethane	1.2 ug/L	TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**
TB-03-11-15-07	11/15/07	Dichloromethane	0.94 ug/L	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-0'DL** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'**

Sample "RINSATE-3" was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate Blank ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE-3	11/15/07	Styrene	0.39 ug/L	All soil samples in SDG TRNC-D-5

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-FJ-02-0'**	Dichloromethane	7.4 ug/Kg	7.4U ug/Kg
TSB-FJ-02-0'-FD**	Dichloromethane	6.3 ug/Kg	6.3U ug/Kg
TSB-FJ-02-10'**	Dichloromethane	7.6 ug/Kg	7.6U ug/Kg
TSB-FR-02-10'**	Dichloromethane	7.0 ug/Kg	7.0U ug/Kg
TSB-FJ-09-0'**	Dichloromethane	6.4 ug/Kg	6.4U ug/Kg
TSB-FJ-09-10'**	Dichloromethane	7.5 ug/Kg	7.5U ug/Kg
TSB-FR-03-0'**	Dichloromethane	6.7 ug/Kg	6.7U 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.

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 relative percent difference (RPD) was not within QC limits for one compound, the MS/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. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7325161LCS/D (TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P
7329018LCS/D (TB-4-11-15-07 7329018MB)	Bromomethane Vinyl acetate	195 (38-140) 152 (23-140)	177 (38-140) 152 (23-140)	- -	J+ (all detects) J+ (all detects)	P
7329018LCS/D (TB-4-11-15-07 7329018MB)	Iodomethane	232 (33-140)	180 (33-140)	25 (≤20)	J (all detects) UJ (all non-detects)	P

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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FJ-10-0'**	Acetone	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

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

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Toluene	0.61	0.57	-	0.04 ug/Kg (≤5.2)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
Acetone	15	6.2	-	8.8 ug/Kg (≤21)	-	-
Methylene chloride	7.4	6.3	-	1.1 ug/Kg (≤5.2)	-	-

*BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-0'DL**	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-5	TSB-FR-03-10'**	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times
*TRNC-D-5	RINSATE-3 TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 TB-4-11-15-07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-5	TSB-FJ-10-0'DL**	Acetonitrile 2-Nitropropane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TB-4-11-15-07	Bromomethane Iodomethane Methyl ethyl ketone	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'**	Dichloromethane Acetone Acetonitrile	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FR-03-10'**	Dichloromethane Acetonitrile Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FR-02-0'**	Nonanal	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-10-0'DL**	Iodomethane Nonanal	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 TB-4-11-15-07 TSB-FJ-10-0'DL**	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TB-4-11-15-07	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'**	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TSB-FR-03-10'** TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FR-02-0'**	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-0'DL**	Acetonitrile 2-Nitropropane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TSB-FJ-10-0'DL**	Iodomethane Vinyl acetate Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (RRF)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-5	TB-4-11-15-07	Bromomethane Vinyl acetate	J+ (all detects) J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-5	TB-4-11-15-07	Iodomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)(RPD)
TRNC-D-5	TSB-FJ-10-0'**	Acetone	J (all detects)	A	Compound quantitation and CRQLs

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-10-0'DL** (50x)	2-Hexanone Dichloromethane	1100U ug/Kg 270U ug/Kg	A
TRNC-D-5	TSB-FJ-03-0'**	Toluene	5.2U ug/Kg	A
TRNC-D-5	TSB-FJ-03-0'-FD**	Toluene	5.3U ug/Kg	A
TRNC-D-5	TSB-FJ-03-10'**	Toluene	5.4U ug/Kg	A
TRNC-D-5	TSB-FJ-10-0'**	Toluene	5.3U ug/Kg	A
TRNC-D-5	TSB-FJ-10-10'**	Toluene	5.2U ug/Kg	A
TRNC-D-5	TSB-FJ-04-0'**	Toluene	5.2U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-5	TSB-FR-02-0'**	Acetone Toluene	64U ug/Kg 5.1U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Acetone Dichloromethane	21U ug/Kg 6.3U ug/Kg	A
TRNC-D-5	TSB-FJ-02-10'**	Acetone Dichloromethane	22U ug/Kg 7.6U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'**	Acetone Dichloromethane	21U ug/Kg 7.4U ug/Kg	A
TRNC-D-5	TSB-FR-02-10'**	Acetone Dichloromethane	22U ug/Kg 7.0U ug/Kg	A
TRNC-D-5	TSB-FJ-09-0'**	Acetone Dichloromethane	21U ug/Kg 6.4U ug/Kg	A
TRNC-D-5	TSB-FJ-09-10'**	Acetone Dichloromethane	22U ug/Kg 7.5U ug/Kg	A
TRNC-D-5	TSB-FR-03-0'**	Acetone Dichloromethane	22U ug/Kg 6.7U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-02-0'**	Dichloromethane	7.4U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Dichloromethane	6.3U ug/Kg	A
TRNC-D-5	TSB-FJ-02-10'**	Dichloromethane	7.6U ug/Kg	A
TRNC-D-5	TSB-FR-02-10'**	Dichloromethane	7.0U ug/Kg	A
TRNC-D-5	TSB-FJ-09-0'**	Dichloromethane	6.4U ug/Kg	A
TRNC-D-5	TSB-FJ-09-10'**	Dichloromethane	7.5U ug/Kg	A
TRNC-D-5	TSB-FR-03-0'**	Dichloromethane	6.7U ug/Kg	A

LDC #: 18100E1
SDG #: TRNC-D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12/08
Page: 1 of 1
Reviewer: 9
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
I.	Technical holding times	SW	Sampling dates: 11/15/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. Y2
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	SW	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 1+2 . 9+10 .
XVII.	Field blanks	SW	TB = 18 . 19 . 20 . 23* . R = 2

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

1	TSB-FJ-03-0'**	S	11	TSB-FJ-02-10'**	S	21	RINSATE-3	W	31	T329018MB W
2	TSB-FJ-03-0'-FD**		12	TSB-FR-02-0'**	2	22	TB-4-11-15-07	W	32	T325161MB W
3	TSB-FJ-03-10'**		13	TSB-FR-02-10'**		23	TSB-FJ-10-0'MS	S	33	T330403MB S
4	TSB-FJ-10-0'**		14	TSB-FJ-09-0'**		24	TSB-FJ-10-0'MSD		34	T333515MB S
5	TSB-FJ-10-0'DL**		15	TSB-FJ-09-10'**		25	TSB-FR-02-0'MS		35	T333508MB S
6	TSB-FJ-10-10'**		16	TSB-FR-03-0'**		26	TSB-FR-02-0'MSD		36	T335121MB S
7	TSB-FJ-04-0'**		17	TSB-FR-03-10'**		27			37	T339426MB S
8	TSB-FJ-04-10'**		18	TB-01-11-15-07	W	28			38	
9	TSB-FJ-02-0'**		19	TB-02-11-15-07	2	29			39	
10	TSB-FJ-02-0'-FD**		20	TB-03-11-15-07		30			40	

LDC #: 18100 21
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: V

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
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 $\geq$ 0.990?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) > 0.05?		✓		
IV. Continuing calibration				
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) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?		✓		
V. Blanks				
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.	✓			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicate				
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?	✓			

LDC #: 18002E1
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
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?			✓	
X. Internal standards				
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?	✓			
XI. Target compound identification				
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?	✓			
XII. 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?	✓			
XIII. Tentatively identified compounds (TICs)				
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 required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. Dichloromethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Nonanal
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Dimethyl Disulfide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. 2-Nitropropane
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	TTTT.
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.

LDC #: 18100E1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria? _____

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
5, 23, 24	S	N	11-15-07	NA	11-30-07	15	J- (HA)
17	↓	↓	↓	↓	↓	↓	J- (HA)
~~23~~							

TECHNICAL HOLDING TIME CRITERIA

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

LDC #: 18100Z1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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Reviewer: R
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".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	1 CAL	PP		0.04881	MW-1,	J / UJ / A
		(C)	MM		0.03735	T329018MB	
			PPP		0.03359	T325161MB	
	11/16/07	1 CAL	WWW		0.00331		
		(C)					
	11/13/07	1 CAL	ZZZZ		0.00932	MW-1, 4.6-1T,	J / UJ / A
		(F)	NN		0.04730	T330403MB	
	11/17/07	DICAL	WWW		0.00164	T333508MB	
						T335121MB	
						25-36	
	11/29/07	ICAL	ZZZZ		0.00365	5, 23-24	J / UJ / A
			RRR		0.04718	T333515MB	

INICAL.1SB

LDC #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICV68247 (ICV)	Nonanal	32.7568J		MW-20, T3-9018MB T3251611MB	J+ dets/A
	11/19/07	CAL6873	WWW		0.00314	18-21, T3251611MB	J/UJ/A
	↓	CAL6874	NNNN		0.02835		
			PP		0.04881		
			RR		0.04664		
			MM		0.03391		
			B	31.453T4			J+/UJ dets/A
	11/20/07	CAL6902	B	64.95T4		22, T3-9018MB	J+ dets/A
			NNNN	85.2160J			
			NN	188			
			PP		0.04492		J/UJ/A
			RR		0.04910		
			MM		0.03949		
	11/20/07	CAL6901	WWW		0.00354		
	11/19/07	FCAL8464	0000	27.8400		9-11, 13-16	J+ dets/A
			F	38.9436T		T3335081MB	
			ZZZZ	33.03338			
			ZZZZ		0.01239		J/UJ/A
			NN		0.04487		
	11/19/07	FCAL8465	WWW		0.00145		

LDC #: 18002I
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 2 of 2
Reviewer: 4
2nd Reviewer:

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/30/07	FCAL8500	OOOO	32.20394		IC: T33512MB	J+ dets/A
			EEEE	52.78688			
			PPPP	28.28801			
			CCCC		0.01423		UN/A
	11/30/07	FCAL8501	WWW		0.00164		
	11/25/07	FCAL8261	WWW		0.00138	1-4.6-8.12	UN/A
	↓	FCAL8262	EEEE		0.01063	T330403MB	
			PPPP	26.02663		25-26	J+ dets/A
	11/29/07	FICV9430 (ICV)	NNNN	39.14797		23-24	J+ dets/A
			HH	40.79661		T33515MB	
			PPPP	227			
	11/30/07	FCAL9455	NNNN	50.38991		23-24	J+ dets/A
			PPPP	33.50982		T33515MB	
			EEEE		0.00407		UJ/A
			RRRR		0.04674		

LDC #: 18600E1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/30/07
Conc. units: µg/kg
Associated Samples: 5

Compound	Blank ID	Sample Identification								
T3335SMB	5 (50X)									
Methylene chloride										
Acetone	920									
2	580	240/1000								
Dichloromethane	71	96/570								
DDT	34									
CRQL										

Blank analysis date:
Conc. units:
Associated Samples:

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100E1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/25/07
Conc. units: ug/kg
Associated Samples: 1-4, 6-8, 12

Compound	Blank ID	Sample Identification								
	733403MB	1	2	3	4	6	7	8 12		
Methylene chloride										
Acetone	8.0				1900			6J/U		
CC	1.1	0.61/5.2U	0.57/5.3U	0.51/5.4U	1.7/5.3U	0.67/5.2U	8.0 80/5.2U	0.78/5.1U		
CRQL										

Blank analysis date: 11/29/07
Conc. units: ug/kg
Associated Samples: 9-11, 13-16

Compound	Blank ID	Sample Identification								
	733508MB	9	10	11	9	13	14	15	16	
Methylene chloride										
Acetone	5.6	15/21U	6.2/21U	12/22U	15/21U	17/22U	13/21U	15 32U	22/U	
Dichloromethane	5.6	7.4/U	6.3/U	7.6/U	7.4/U	7.0/U	6.4/U	7.5/U	6.7/U	
CC	0.85									
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18600E1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd Reviewer: [illegible]

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

(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: ug/L Associated sample units: ug/kg
Sampling date: 11/15/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: all soils, #2

Compound	Blank ID	Sample Identification									
	18	5	9	#10	#11	13	14	15	16	
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.87	(96)	7.4/U	6.3/U	7.6/U	7.0/U	6.4/U	7.5/U	6.7/U	
CRQL										

Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/15/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other: _____ Associated Samples: 12-17

Compound	Blank ID	Sample Identification									
	19	13	14	15	16					
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	1.2	7.0/U	6.4/U	7.5/U	6.7/U					
CRQL										

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 #: 18100E1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: VA

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

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: ug/L Associated sample units: ug/kg
Sampling date: 11/13/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples: 1-11

Compound	Blank ID	Sample Identification								
	20	5	9	10	11	13	14			
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.94 (96)	7.4 U	6.3 U	7.6 U	7.0 U	6.4 U				
CRQL										

Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/15/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples: all 50.1's

Compound	Blank ID	Sample Identification								
	21									
Methylene chloride										
Acetone										
Chloroform										
FF	0.39									
CRQL										

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 #: 18002
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: 9
2nd Reviewer: 12

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".

(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.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A 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	Qualifications
		25/26	HH	( )	( )	35 (≤ 20)	12	No qual (70R in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 18100 21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1a

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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T32516 LCS/D	B	150 (38-140)	144 (38-140)	( )	18-21. T32516 MB	J+ dets/P
			D	( )	( )	#2 (≤20)		No qual
			F	( )	( )	24 (↓)		↓
			NN	( )	( )	34 (↓)		
				( )	( )	( )		
		T329018 LCS/D	B	195 (38-140)	177 (38-140)	( )	22. T329018 MB	J+ dets/P
			CCCC	( )	( )	26 (≤20)		No qual
			NNNN	232 (33-140)	180 (33-140)	25 ↓ ( )		J+/NJ/P
			HH	152 (33-140)	152 (33-140)	( )		J+ dets/P
				( )	( )	( )		
		T330403 LCS/D	HH	151 (56-115)	152 (56-115)	( )	1-4. 6-8. 12	No qual
				( )	( )	( )	T330403 MB	(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
		T333508 LCS/D	HH	146 (56-115)	143 (56-115)	( )	9-11. 13-16	No qual
				( )	( )	( )	T333508 MB	(MS/MSD in)
				( )	( )	( )		
		T33512 LCS	HH	154 (56-115)	( )	( )	17. T33512 MB	No qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100E1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: 9
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".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		4	F > calib range	+	J det / J

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100B1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer:

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/kg)		D RPD
	1	2	
CC	0.61	0.57	0.04 (≤5.2) No Qual

Compound	Concentration (µg/kg)		D RPD
	9	10	
F	15	6.2	8.8 (≤21) No Qual
* 0000	7.4	6.3	1.1 (≤5.2) ↓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18100-21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

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:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
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
X = Mean of the RRFs

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/13/07	S (1st internal standard)	0.28500	0.28500	0.29152	0.29152	10.977	10.97
			CC (2nd internal standard)	0.95833	0.95833	0.97869	0.97869	7.27374	7.2737
			MMM (3rd internal standard)	2.45226	2.45226	2.48536	2.48536	4.43510	4.4351
2	ICAL	11/17/07	WWW (1st internal standard)	0.00153	0.00153	0.00164	0.00164	9.10389	8.98899
			BBBB (2nd internal standard)	0.52462	0.52462	0.52212	0.52212	15.80940	15.8092
			OOO (3rd internal standard)	1.25801	1.25801	1.34097	1.34097	9.49562	9.49560
3	ICAL	11/29/07	S (1st internal standard)	0.42334	0.42334	0.48260	0.48260	8.51866	8.5182
			CC (2nd internal standard)	1.46695	1.46695	1.43348	1.43348	4.37617	4.37606
			MMM (3rd internal standard)	0.53464	0.53464	0.50428	0.50428	4.62900	4.6297
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 #: 18100Z1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: C

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	FCAL8262	11/25/07	S (1st internal standard)	0.29152	0.28699	0.28699	1.55455	1.5544
			CC (2nd internal standard)	0.97869	1.07424	1.07424	9.58158	9.5819
			MMM (3rd internal standard)	2.48536	2.77949	2.77949	11.8345	11.8391
2	FCAL8261	11/25/07	WWW (1st internal standard)	0.00164	0.00138	0.00138	15.60088	15.592
			AAAA (2nd internal standard)	0.52212	0.55233	0.55233	5.7865	5.7864
			OOO (3rd internal standard)	1.34097	1.37020	1.37020	2.17980	2.1796
3	FCAL8464	11/29/07	S (1st internal standard)	0.29152	0.28738	0.28738	1.41945	1.4195
			CC (2nd internal standard)	0.97869	1.08694	1.08694	11.0600	11.0603
			MMM (3rd internal standard)	2.48536	2.50015	2.50015	0.59516	0.59505
4	FCAL8465	11/29/07	WWW (1st internal standard)	0.00164	0.00145	0.00145	11.81560	11.8049
			AAAA (2nd internal standard)	0.52212	0.56952	0.56952	9.07859	9.0786
			OOO (3rd internal standard)	1.34097	1.42815	1.42815	6.50132	6.5010

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 #: 18100Z1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: [illegible]

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	FCA8500	11/30/07	S (1st internal standard)	0.2952	0.30005	0.30005	2.9254	2.9255
			CC (2nd internal standard)	0.9T869	1.11983	1.11983	4.42058	4.4209
			MMM (3rd internal standard)	2.48536	2.T23T9	2.T23T9	9.59361	9.5935
2	FCA8501	11/30/07	WWW (1st internal standard)	0.00164	0.00164	0.00164	0.30839	0.29768
			8888 (2nd internal standard)	0.52212	0.49863	0.49863	4.49885	4.4989
			000 (3rd internal standard)	1.3409T	1.28956	1.28956	3.8337O	3.834
3	GCA9455	11/30/07	S (1st internal standard)	0.48260	0.46TTT	0.46TTT	3.0T342	3.0T31
			CC (2nd internal standard)	1.43348	1.35090	1.35090	5.T6065	5.T607
			MMM (3rd internal standard)	0.50428	0.58382	0.58382	15.TT310	15.TT35
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 recalculated results.

LDC #: 18100Z1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	50	45.0546	90	90	0
Bromofluorobenzene	↓	42.8873	86	86	↓
1,2-Dichloroethane-d4		41.3154	83	83	
Dibromofluoromethane		43.7186	87	87	

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 #: 18002-1
SDG #: 300010rv

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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 = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 25/26

Compound	Spike Added (µg/L)		Sample Concentration (µg/kg)	Spiked Sample Concentration (µg/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	.....	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	51.3	50.8	ND	40.8	45.1	80	80	89	89	9.9	10
Trichloroethene	↓	↓	↓	35.0	38.8	68	68	76	76	10	10
Benzene	↓	↓	↓	40.3	43.5	78	78	86	86	7.6	7.6
Toluene	↓	↓	0.78	40.7	43.5	78	78	84	84	6.6	6.6
Chlorobenzene	↓	↓	ND	39.5	41.6	77	77	82	82	5.1	5.2

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 #: 18001
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: 9
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 and laboratory 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 = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: T330403LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	50	50	51.8	49.4	104	104	99	99	4.8	4.7
Trichloroethene			47.7	46.6	95	95	93	93	2.4	2.3
Benzene			50.9	50.2	102	102	100	100	1.5	1.4
Toluene			55.6	52.0	111	111	104	104	6.6	6.7
Chlorobenzene			53.1	51.5	106	106	103	103	3.1	3.1

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 #: 18100e1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: W

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

Y N N/A Were all reported results recalculated and verified for all level IV samples?

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

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

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

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

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

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 2 , CC

Conc. = $\frac{(25546)(50)(5)(1)}{(24787)(0.9787)(5.0)(0.941)}$

= 0.567 ug/kg

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-0'RE
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
TB3-11-16-07
TB1-11-16-07
TB4-11-16-07
RINSATE-4
TB5-11-16-07
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
TSB-FJ-01-0'REMS
TSB-FJ-01-0'REMSD

Introduction

This data review covers 20 soil samples and 5 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.

Raw data were not reviewed for this SDG. The review was 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
*11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥0.05) 0.04730 (≥0.05)	All soil samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥0.05)	All soil samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

*Indicates change as the result of report review.

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
11/20/07 (LCAL6902)	Bromomethane Iodomethane Methyl ethyl ketone	64.95744 85.21601 188	All water samples in SDG TRNC-D-6	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/29/07 (FCAL8464)	Dichloromethane Acetone Acetonitrile	27.78400 28.94367 33.03338	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS TSB-FJ-01-0'MSD 7333508MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/30/07 (FCAL8500)	Dichloromethane Acetonitrile Nonanal	32.20394 52.78688 28.28801	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' *TSB-FJ-01-10' TSB-FJ-01-0'REMS TSB-FJ-01-0'REMSD 7335121MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-6	J+ (all detects)	A

*Indicates change as the result of report review.

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
11/20/07 (LCAL6902)	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.04492 (≥0.05) 0.04910 (≥0.05) 0.03949 (≥0.05)	All water samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A
11/20/07 (LCAL6901)	Ethanol	0.00354 (≥0.05)	All water samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8464)	Acetonitrile Methyl ethyl ketone	0.01239 (≥0.05) 0.04487 (≥0.05)	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS TSB-FJ-01-0'MSD 7333508MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8465)	Ethanol	0.00145 (≥0.05)	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS TSB-FJ-01-0'MSD 7333508MB	J (all detects) UJ (all non-detects)	A
*11/30/07 (FCAL8500)	Acetonitrile	0.01423 (≥0.05)	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10' TSB-FJ-01-0'REMS TSB-FJ-01-0'REMSD 7335121MB	J (all detects) UJ (all non-detects)	A

*Indicates change as the result of report review.

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/30/07 (FCAL8501)	Ethanol	0.00164 (≥0.05)	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10' TSB-FJ-01-0'REMS TSB-FJ-01-0'REMSD 7335121MB	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
7333508MB	11/29/07	Dichloromethane Acetone Toluene	5.6 ug/Kg 5.6 ug/Kg 0.85 ug/Kg	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'

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-FR-05-0'	Dichloromethane Acetone	7.3 ug/Kg 14 ug/Kg	7.3U ug/Kg 21U ug/Kg
TSB-FR-04-0'	Dichloromethane	6.4 ug/Kg	6.4U ug/Kg
TSB-FR-05-10'	Dichloromethane Acetone	7.0 ug/Kg 16 ug/Kg	7.0U ug/Kg 22U ug/Kg
TSB-FR-04-0'-FD	Dichloromethane Acetone	7.4 ug/Kg 13 ug/Kg	7.4U ug/Kg 22U ug/Kg

*Indicates change as the result of report review.

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-FR-04-10'	Dichloromethane Acetone	8.5 ug/Kg 8.8 ug/Kg	8.5U ug/Kg 22U ug/Kg
TSB-FJ-01-0'	Dichloromethane Acetone	8.7 ug/Kg 40 ug/Kg	8.7U ug/Kg 40U ug/Kg

Samples TB3-11-16-07, TB1-11-16-07, TB4-11-16-07, and TB5-11-16-07 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
TB3-11-16-07	11/16/07	Dichloromethane	0.99 ug/L	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10'
TB1-11-16-07	11/16/07	Dichloromethane	0.93 ug/L	TSB-FJ-01-0' TSB-FJ-01-0'RE TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5'
TB4-11-16-07	11/16/07	Dichloromethane	0.92 ug/L	TSB-GJ-01-0' TSB-GJ-01-5'
TB5-11-16-07	11/16/07	Dichloromethane	0.86 ug/L	RINSATE-4

Sample "RINSATE-4" was identified as a rinsate. No volatile contaminants were found in this blank.

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-FR-05-0'	Dichloromethane	7.3 ug/Kg	7.3U ug/Kg

*Indicates change as the result of report review.

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-FR-05-10'	Dichloromethane	7.0 ug/Kg	7.0U ug/Kg
TSB-FR-04-0'	Dichloromethane	6.4 ug/Kg	6.4U ug/Kg
TSB-FR-04-0'-FD	Dichloromethane	7.4 ug/Kg	7.4U ug/Kg
TSB-FR-04-10'	Dichloromethane	8.5 ug/Kg	8.5U ug/Kg
TSB-FJ-01-0'	Dichloromethane	8.7 ug/Kg	8.7U 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.

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 (%R) were not within QC limits for several compounds, the MS/MSD or LCS 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. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7329018LCS/D (All water samples in SDG TRNC-D-6)	Bromomethane Vinyl acetate	195 (38-140) 152 (23-140)	177 (38-140) 152 (23-140)	- -	J+ (all detects) J+ (all detects)	P
7329018LCS/D (All water samples in SDG TRNC-D-6)	Iodomethane	232 (33-140)	180 (33-140)	25 (≤20)	J (all detects) UJ (all non-detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

*Indicates change as the result of report review.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-01-0'	Fluorobenzene Chlorobenzene-d5 1,4-Dichlorobenzene-d4	1974291 (2227127-8908506) 1302200 (1361549-5446196) 647186 (664527-2658106)	All TCL compounds	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Acetone	67	13	-	54 ug/Kg (≤21)	J (all detects)	A
Dichloromethane	6.4	7.4	-	1 ug/Kg (≤5.2)	-	-
1,2,4-Trimethylbenzene	0.47	5.4U	-	4.93 ug/Kg (≤5.4)	-	-

*Indicates change as the result of report review.

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Methyl ethyl ketone	4.5	22U	-	17.5 ug/Kg (≤22)	-	-

*Indicates change as the result of report review.

*BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
*TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'RE TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromomethane Iodomethane Methyl ethyl ketone	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'	Dichloromethane Acetone Acetonitrile	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10'	Dichloromethane Acetonitrile Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)

*Indicates change as the result of report review.

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-6	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromomethane Vinyl acetate	J+ (all detects) J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Iodomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)(RPD)
TRNC-D-6	TSB-FJ-01-0'	All TCL compounds	J (all detects) UJ (all non-detects)	A	Internal standards (area)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Acetone	J (all detects)	A	Field duplicates (Difference)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-05-0'	Dichloromethane Acetone	7.3U ug/Kg 21U ug/Kg	A

*Indicates change as the result of report review.

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-04-0'	Dichloromethane	6.4U ug/Kg	A
TRNC-D-6	TSB-FR-05-10'	Dichloromethane Acetone	7.0U ug/Kg 22U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Dichloromethane Acetone	7.4U ug/Kg 22U ug/Kg	A
TRNC-D-6	TSB-FR-04-10'	Dichloromethane Acetone	8.5U ug/Kg 22U ug/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Dichloromethane Acetone	8.7U ug/Kg 40U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-05-0'	Dichloromethane	7.3U ug/Kg	A
TRNC-D-6	TSB-FR-05-10'	Dichloromethane	7.0U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'	Dichloromethane	6.4U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Dichloromethane	7.4U ug/Kg	A
TRNC-D-6	TSB-FR-04-10'	Dichloromethane	8.5U ug/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Dichloromethane	8.7U ug/Kg	A

*Indicates change as the result of report review.

LDC #: 18100F1
SDG #: TRNC-D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: 9
2nd Reviewer: V

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
I.	Technical holding times	A	Sampling dates: 11/16/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. Y 2
IV.	Continuing calibration/ICV	SW	ICV≤25/D
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D=5+6
XVII.	Field blanks	SW	TB=17.18.19.21. E=20*

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:

1	TSB-FJ-08-0'	S	11	TSB-GR-01-0'	3	S	21	TB5-11-16-07	SW	31	7329018MB W
2	TSB-FJ-08-10'		12	TSB-GR-01-5'	3		22	TSB-FJ-01-0'MS	S	32	T333508MB
3	TSB-FR-05-0'		13	TSB-GJ-06-0'	3		23	TSB-FJ-01-0'MSD		33	T335721MB
4	TSB-FR-05-10'		14	TSB-GJ-06-5'	3		24	REMS		34	
5	TSB-FR-04-0'		15	TSB-GJ-01-0'	4		25	REMSD		35	
6	TSB-FR-04-0'-FD		16	TSB-GJ-01-5'	4		26			36	
7	TSB-FR-04-10'		17	TB3-11-16-07	1	W	27			37	
8	TSB-FJ-01-0'	2	18	TB1-11-16-07	2/3		28			38	
9	TSB-FJ-01-0'RE	2	19	TB4-11-16-07	4		29			39	
10	TSB-FJ-01-10'	2	20	RINSATE-4	5		30			40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. 2-Nitropropane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
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	TTTT.
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.

LDC #: 13007F1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICAL	[illegible]		0.04881	MW-2, T329018MB	J / UJ / A
		(C)	MM		0.03735		
			[illegible] NNNN		0.03359		
	11/16/07	ICAL	WWW		0.00331		
		(C)					
	11/13/07	ICAL	EEE		0.00932	MW-5, T333508MB	J / UJ / A
		(F)	NN		0.04730	T333521MB	
	11/11/07	ICAL	WWW		0.00164		

INICAL.1SB

LDC #: 18100F1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 4
2nd Reviewer:

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICV68247 (ICV)	Nonanal	32.75684		MW-20-3, T39018MB	J+ dets / A
	11/20/07	LCAL6902	B	64.95744			J+ dets / A
			NNNN	86.21601			
			NN	188			
			PP		0.04492		J / MW / A
			RR		0.04910		
			MM		0.03949		
	11/20/07	LCAL6901	WWW		0.00354		J / MW / A
	11/29/07	FCAL8464	Dichloromethane	27.78400		3-8.22-23	J+ dets / A
			F	28.94367		7333508MB	
			EEEE	33.03338			J / MW / A
			EEEE		0.01239		
			NN		0.04487		
	11/29/07	FCAL8465	WWW		0.00145		
	11/30/07	FCAL8500	Dichloromethane	32.20394		1-2.9-16.24-25	J+ dets / A
			EEEE	50.78688		733521MB	
			Nonanal	28.28801			J / MW / A
			EEEE		0.01423		
	11/30/07	FCAL8501	WWW		0.00164		

LDC #: 18200F1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/29/07
Conc. units: ug/kg
Associated Samples: 3 - 8

Compound	Blank ID	Sample Identification								
75323	8MB	3	4	5	4	6	7	8		
Dichloromethane (Methylene chloride)	5.6	7.3 U	7.6 / 22 U	6.4 U	7.0 U	7.4 U	8.5 U	8.7 U		
Acetone	5.6	14 / 22 U	7.0 / 22 U	(GT)	16 / 22 U	13 / 22 U	8.8 / 22 U	40 U		
cc	0.85									
CRQL										

Blank analysis date: _____
Conc. units: _____
Associated Samples: _____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 13100F1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

X N /N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?
Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/16/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other: _____ Associated Samples: 1-7

Compound	Blank ID	Sample Identification								
	17	3	4	5	6	7				
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.99	7.3/U	7.0/U	6.4/U	7.4/U	8.5/U				
CRQL										

Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/16/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other: _____ Associated Samples: 8-14

Compound	Blank ID	Sample Identification								
	18	8								
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.93	8.7/U								
CRQL										

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 #: 18100F1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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

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: ug/L **Associated sample units:** ug/Kg
Sampling date: 11/16/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ **Associated Samples:** 15 – 16

Compound	Blank ID	Sample Identification								
	19									
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.92									
CRQL										

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 11/16/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ **Associated Samples:** 20

Compound	Blank ID	Sample Identification								
	21									
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.86									
CRQL										

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 #: 18100F1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

(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.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A 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	Qualifications
		22/23	N	54 (59-136)	( )	( )	8	No Qual
			QQ	49 (56-133)	( )	( )		✓
			ZZZZ	160 (49-150)	( )	( )		
				( )	( )	( )		(LCS only)
				( )	( )	( )		
				( )	( )	( )		
		24/25	F	362 (33-150)	274 (33-150)	( )	9	No Qual
			Z	200 (46-150)	176 (46-150)	( )		
			Y	218 (45-150)	224 (45-150)	( )		
			NN	257 (35-150)	249 (35-150)	( )		
			MM	174 (28-150)	169 (28-150)	( )		
			OOO	195 (20-150)	190 (20-150)	( )		
			ZZZZ	352 (49-150)	343 (49-150)	( )		
			HH	217 (10-150)	206 (10-150)	( )		~~Delete A~~
				( )	( )	( )		
				( )	( )	( )		(LCS or MS/MSD from other SDG ok)
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 18100F1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7329018LCS/D	B	195 (38-140)	177 (38-140)	( )	All 10s. T329018MB	J+ det. /P
			EEE	( )	( )	26 (≤20)		No Qual
			NNNN	232 (33-140)	180 (33-140)	25 ✓		J / UJ / P
			HH	152 (23-140)	152 (23-140)	( )		J+ det. /P
				( )	( )	( )		
				( )	( )	( )		
		T333508LCS/D	HH	146 (56-115)	143 (56-115)	( )	~~12. 9-16~~ 3-8	No Qual
				( )	( )	( )	T333508MB	(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
		T335121LCS	HH	154 (56-115)	( )	( )	1-2. 9-16	~~J+ det. /P~~
				( )	( )	( )	T335121MB	No Qual
				( )	( )	( )		
				( )	( )	( )		(See F7K200203
				( )	( )	( )		MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100F1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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".

Y N N/A Were all internal standard area counts within -50 to +100% of the associated calibration standard?

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

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		8	FBZ	197491 (222127-890506)		J/UJ/A (all)
			CBZ	1302200 (1361549-5446196)		
			4DCB	647186 (664527-2658106)		
		22 (MS)	FBZ	130469		No qual
			CBZ	837626		
			4DCB	471131		

(BCM) = Bromochloromethane
(DFB) = 1,4-Difluorobenzene
(CBZ) = Chlorobenzene-d5
(PFB) = Pentafluorobenzene
(4DCB) = 1,4-Dichlorobenzene-d4
(2DCB) = 1,2-Dichlorobenzene-d4
(FBZ) = Fluorobenzene

LDC #: 18100F1
SDG #: Sacover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: Q
2nd reviewer:

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/kg) 5	6	RPD
F	67	~~7.4~~ 13	(≤5.2)
Dichloromethane	6.4	7.4	
DDD	0.47		
NN	4.5		

Compound	Concentration (ug/kg) 5	6	RPD
F	67	13	54 (≤21) J det/A
Dichloromethane	6.4	7.4	1 (≤5.2) Normal
DDD	0.47	5.4 U	4.93 (≤5.4)
NN	4.5	22 U	17.5 (≤22) J

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TB1-11-19-07
TB2-11-19-07
TB3-11-19-07
TB4-11-19-07
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD
TSB-GJ-07-5'MS
TSB-GJ-07-5'MSD
RINSATE-5MS
RINSATE-5MSD

Introduction

This data review covers 18 soil samples and 7 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
RINSATE-5	All aromatic compounds	10	7	J- (all detects) UJ (all non-detects)	P

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
*11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A

*Indicates change as the result of report review.

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥0.05) 0.04730 (≥0.05)	All soil samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥0.05)	All soil samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A

*Changed compound Nonanal to Iodomethane in above table

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
11/30/07 (FCAL8500)	Dichloromethane Acetonitrile Nonanal	32.20394 52.78688 28.28801	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7335121MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/29/07 (LCAL7103)	Bromomethane	173	All water samples in SDG TRNC-D-7	J+ (all detects)	A
12/3/07 (FCAL8567)	Acetonitrile	39.05814	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5' TSB-GJ-07-5'MS TSB-GJ-07-5'MSD 7338138MB	J+ (all detects)	A

*Indicates change as the result of report review.

The percent differences (%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 with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/30/07 (FCAL8500)	Acetonitrile	0.01423 (≥0.05)	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7335121MB	J (all detects) UJ (all non-detects)	A
11/30/07 (FCAL8501)	Ethanol	0.00164 (≥0.05)	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7335121MB	J (all detects) UJ (all non-detects)	A
11/29/07 (LCAL7103)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.04008 (≥0.05) 0.04763 (≥0.05) 0.04435 (≥0.05) 0.03242 (≥0.05)	All water samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A
11/29/07 (LCAL7104)	Ethanol	0.00322 (≥0.05)	All water samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A
12/3/07 (FCAL8567)	Acetonitrile Methyl ethyl ketone	0.01296 (≥0.05) 0.04819 (≥0.05)	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5' TSB-GJ-07-5'MS TSB-GJ-07-5'MSD 7338138MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

*Indicates change as the result of report review.

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
12/3/07 (FCAL8566)	Ethanol	0.00134 (≥0.05)	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5' TSB-GJ-07-5'MS TSB-GJ-07-5'MSD 7338138MB	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
7334157MB	11/29/07	Dichloromethane	0.60 ug/L	All water samples in SDG TRNC-D-7

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
TB1-11-19-07	Dichloromethane	0.96 ug/L	1.0U ug/L
TB2-11-19-07	Dichloromethane	0.83 ug/L	1.0U ug/L
TB3-11-19-07	Dichloromethane	1.0 ug/L	1.0U ug/L
TB4-11-19-07	Dichloromethane	0.93 ug/L	1.0U ug/L

Samples TB1-11-19-07, TB2-11-19-07, TB3-11-19-07, and TB4-11-19-07 were identified as trip blanks. No volatile contaminants were found in these blanks with the following exceptions:

*Indicates change as the result of report review.

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB1-11-19-07	11/19/07	Dichloromethane Trichloroethene	0.96 ug/L 0.45 ug/L	TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'
TB2-11-19-07	11/19/07	Dichloromethane Trichloroethene	0.83 ug/L 0.27 ug/L	TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'
TB3-11-19-07	11/19/07	Dichloromethane Trichloroethene	1.0 ug/L 0.24 ug/L	All soil samples in SDG TRNC-D-7
TB4-11-19-07	11/19/07	Dichloromethane	0.93 ug/L	RINSATE-5

Sample "RINSATE-5" was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE-5	11/19/07	Trichloroethene	0.17 ug/L	All soil samples in SDG TRNC-D-7

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-GJ-03-0'	Dichloromethane	3.1 ug/Kg	5.0U 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:

*Indicates change as the result of report review.

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TB4-11-19-07	Bromofluorobenzene	116 (71-115)	Nonanal	J+ (all detects)	A

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 with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
RINSATE-5MS/MSD (RINSATE-5)	Bromomethane	297 (25-150)	332 (25-150)	-	J+ (all detects)	A

VIII. Laboratory Control Samples (LCS)

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

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7341571LCS/D (All water samples in SDG TRNC-D-7)	Bromomethane	270 (38-140)	312 (38-140)	-	J+ (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times with the following exceptions:

*Indicates change as the result of report review.

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-GJ-03-0'	Fluorobenzene	669276 (692014-2768056)	Chloroethane Chloroform Chloromethane Dibromomethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene cis-1,2-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloroethene, total 1,2-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene cis-1,3-Dichloropropene Ethanol Trichlorofluoromethane Acetone Acetonitrile Benzene Chlorobromomethane Bromodichloromethane Bromomethane Carbon disulfide Carbon tetrachloride Iodomethane Dichloromethane 1,1,1-Trichloroethane Vinyl acetate Vinyl chloride Methyl-tert-butyl ether Methyl ethyl ketone Dichlorodifluoromethane 2,4-Dimethylpentane 2-Methylhexane 3-Methylhexane 3-Ethylpentane 2,2-Dimethylpentane 2,3-Dimethylpentane 3,3-Dimethylpentane 2,2,3-Trimethylbutane Trichloroethene	J (all detects) UJ (all non-detects)	P

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

*Indicates change as the result of report review.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Acetone	8.1	6.4	-	1.7 (≤21)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
Acetone	21U	14	-	7 (≤21)	-	-
1,2,4-Trimethylbenzene	5.2U	0.45	-	4.75 (≤5.2)	-	-

*Indicates change as the result of report review.

*BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	RINSATE-5	Benzene Toluene Chlorobenzene Ethylbenzene Styrene Isopropylbenzene n-Propylbenzene 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene 1,3-Dichlorobenzene p-Isopropyltoluene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene 1,3,5-Trichlorobenzene m,p-Xylenes o-Xylene *Bromobenzene *Xylenes, total	J- (all detects) UJ (all non-detects)	P	Technical holding times
*TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Bromochloromethane 1,2-Dibromo-3-chloropropane *Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)

*Indicates change as the result of report review.

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0'	Dichloromethane Acetonitrile Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	TB4-11-19-07	Nonanal	J+ (all detects)	A	Surrogate spikes (%R)
TRNC-D-7	RINSATE-5	Bromomethane	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

*Indicates change as the result of report review.

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-7	TSB-GJ-03-0'	Chloroethane Chloroform Chloromethane Dibromomethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene cis-1,2-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloroethene, total 1,2-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene cis-1,3-Dichloropropene Ethanol Trichlorofluoromethane Acetone Acetonitrile Benzene Chlorobromomethane Bromodichloromethane Bromomethane Carbon disulfide Carbon tetrachloride Iodomethane Dichloromethane 1,1,1-Trichloroethane Vinyl acetate Vinyl chloride Methyl-tert-butyl ether Methyl ethyl ketone Dichlorodifluoromethane 2,4-Dimethylpentane 2-Methylhexane 3-Methylhexane 3-Ethylpentane 2,2-Dimethylpentane 2,3-Dimethylpentane 3,3-Dimethylpentane 2,2,3-Trimethylbutane Trichloroethene	J (all detects) UJ (all non-detects)	P	Internal standards (area)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-7	TB1-11-19-07	Dichloromethane	1.0U ug/L	A

*Indicates change as the result of report review.

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-7	TB2-11-19-07	Dichloromethane	1.0U ug/L	A
TRNC-D-7	TB3-11-19-07	Dichloromethane	1.0U ug/L	A
TRNC-D-7	TB4-11-19-07	Dichloromethane	1.0U ug/L	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-7	TSB-GJ-03-0'	Dichloromethane	5.0U ug/Kg	A

*Indicates change as the result of report review.

LDC #: 18100G1
SDG #: TRNC-D-7
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/19/08
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Reviewer: 9
2nd Reviewer: V

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
I.	Technical holding times	SW	Sampling dates: 11/19/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. r^2
IV.	Continuing calibration/ICV	SW	%R ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 1+2 . 6+7
XVII.	Field blanks	SW	R=15 . TB=16.17.18 . 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:

1	TSB-GR-02-0'	S	11	TSB-GJ-05-0'	S	21	TSB-GJ-04-0'MSD	S	31	T3415TMB	W
2	TSB-GR-02-0'-FD		12	TSB-GJ-05-5'		22	TSB-GJ-07-5'MS		32	T3T204MB	W
3	TSB-GR-02-5'		13	TSB-GJ-03-0'		23	TSB-GJ-07-5'MSD		33	T338138MB	S
4	TSB-GJ-04-0'		14	TSB-GJ-03-5'		24	RINSATE-5MS	W	34	T33512MB	S
5	TSB-GJ-04-5'		15	RINSATE-5	W	25	RINSATE-5MSD		35		
6	TSB-GJ-02-0'		16	TB1-11-19-07		26			36		
7	TSB-GJ-02-0'-FD		17	TB2-11-19-07		27			37		
8	TSB-GJ-02-5'		18	TB3-11-19-07		28			38		
9	TSB-GJ-07-0'		19	TB4-11-19-07		29			39		
10	TSB-GJ-07-5'		20	TSB-GJ-04-0'MS	S	30			40		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	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 chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
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-Dioxane
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	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. 2,2-Dimethylpentane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. 2,4-Dimethylpentane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
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	TTTT.
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.

Aromatics

LDC #: 18100G1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: 9
2nd Reviewer: ✓

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
15	W	N	11-19-07	N/A	11-29-07	10	~~J~~ UJ/P *

TECHNICAL HOLDING TIME CRITERIA

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

LDC #: 18100F1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: R
2nd Reviewer: L

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".

(Y) N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
(Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
(Y) N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
(Y) N N/A Did the initial calibration meet the acceptance criteria?
Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/16/07	ICAL	~~TP~~		0.04881	MW-02	J / UJ / A
		(C)	MM		0.03735	T33415MB	
			~~PPPP Nonane~~ NNNN		0.03359		
	11/16/07	ICAL	WWW		0.00331		
		(C)					
	11/13/07	ICAL	~~EEE~~		0.00932	MW-01S, ~~T33813MB~~	J / UJ / A
		(F)	NN		0.04730	T33512MB	
	11/17/07	DICAL	WWW		0.00164	T33813MB	

LDC #: 18100F1
SDG #: 50C0V6N

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/30/07	FCAL8500	Dichloromethane	32.20394		1-9, 20-21	J+ dets / A
			[illegible]	52.78688		T33521MB	
			Nonanal	28.28801			
			[illegible]		0.01423		
	11/30/07	FCAL8501	WWW		0.00164		J / UJ / A
	11/29/07	LCALT103	B	17.3		MW 1-20	J+ dets / A
			NANAN		0.04008	T33415MB	J / UJ / A
			[illegible]		0.04763		
			[illegible]		0.04435		
			MM		0.03242		
	11/29/07	LCALT104	WWW		0.00322		
	12/3/07	FCAL8567	[illegible]	39.05814		10-14, 22-23	J+ dets / A
			[illegible]		0.01296	T33858MB	J / UJ / A
			NN		0.04819		
	12/3/07	FCAL8566	WWW		0.00134		

LDC #: 18100G1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/29/07
Conc. units: ug/L

Associated Samples: all except HDs

Compound	Blank ID	Sample Identification								
	733157MB	16	17	18	19					
Methylene chloride										
Acetone										
Dichloromethane	0.60	0.96/1.0U	0.83/1.0U	1.0/U	0.93/1.0U					
CRQL										

Blank analysis date:
Conc. units:

Associated Samples:

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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 qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18100G1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

(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: ug/L Associated sample units: ug/kg
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / (Rinsate) / Trip Blank / Other:_____ Associated Samples: All soils

Compound	Blank ID	Sample Identification								
	15	[illegible]								
Methylene chloride										
Acetone										
Chloroform										
S	0.17									
CRQL										

Blank units: ug/L Associated sample units: ug/kg
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ Associated Samples: 6 – 14

Compound	Blank ID	Blank	Sample Identification							
	16	17	13							
Methylene chloride										
Acetone										
Chloroform										
Dichloromethane	0.96	0.83	3!/5.0U							
S	0.45	0.27								
CRQL										

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 #: 13100G1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd Reviewer: 1a

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

(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: ug/L **Associated sample units:** ug/Kg
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other:_____ **Associated Samples:** All Soils

Compound	Blank ID	Sample Identification									
	18	1									
Methylene chloride											
Acetone											
Chloroform											
Dichloromethane	1.0	3.1/5.0 U									
S	0.24										
CRQL											

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ **Associated Samples:** 15

Compound	Blank ID	Sample Identification									
	19										
Methylene chloride											
Acetone											
Chloroform											
Dichloromethane	0.93										
CRQL											

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 #: 18100G1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: 6
2nd Reviewer: L

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".

Y (N) N/A Were all surrogate %R within QC limits?

(Y) (N) 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?

#	Date	Sample ID	Surrogate	%Recovery (Limits)	Qualifications
		19	BFB	116 (71-115)	√+ dets/A (Nonanal)
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	QC Limits (Soil)	QC Limits (Water)
SMC1 (TOL) = Toluene-d8	81-117	88-110
SMC2 (BFB) = Bromofluorobenzene	74-121	86-115
SMC3 (DCE) = 1,2-Dichloroethane-d4	80-120	80-120
SMC4 (DFM) = Dibromofluoromethane	80-120	86-118

LDC #: 15600A-1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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".

(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.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A 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	Qualifications
		24/25	B	291 (25-150)	332 (25-150)	( )	15	1+ dets/A
			I	175 (68-157)	( )	( )		No dual recovery
			QQQ	230 (72-150)	174 (72-150)	28 (≤20)		
			NNNN	252 (20-150)	238 (20-150)	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 18100G2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T33415T LCS/D	B	70 (38-140)	312 (38-140)	( )	all H2O's	J+ detects/P
			NNNN	( )	213 (33-140)	60 (<=20)	T33415T MB	No Qual (LCS in)
			HH	( )	141 (23-140)	44 (V)		V
				( )	( )	( )		
				( )	( )	( )		No Qual
		T33512 LCS	HH	124 (56-115)	( )	( )	1-9. T33512 MB	~~J+ detects/P~~
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
		T338138 LCS	HH	112 (56-115)	( )	( )	10-14. T338138 MB	No Qual (no MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100G1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

Y (N) N/A Were all internal standard area counts within -50 to +100% of the associated calibration standard?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		13	FBZ	669276 (692014-2768056)		J/UJ/P

(BCM) = Bromochloromethane
(DFB) = 1,4-Difluorobenzene
(CBZ) = Chlorobenzene-d5
(PFB) = Pentafluorobenzene
(4DCB) = 1,4-Dichlorobenzene-d4
(2DCB) = 1,2-Dichlorobenzene-d4
(FBZ) = Fluorobenzene

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: TRNC/D-7 Work Order #...: KDAJ31AA Matrix.....: WATER
MB Lot-Sample #: F7K300000-157

Prep Date.....: 11/29/07 Analysis Time..: 13:02
Analysis Date..: 11/29/07 Prep Batch #...: 7334157
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
[redacted]	ND	2.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
2-Chlorotoluene	ND	1.0	ug/L	SW846 8260B
4-Chlorotoluene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
1,2-Dichlorobenzene	ND	1.0	ug/L	SW846 8260B
1,3-Dichlorobenzene	ND	1.0	ug/L	SW846 8260B
1,4-Dichlorobenzene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
1,3-Dichloropropane	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	250	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
n-Heptane	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
[redacted]	ND	10	ug/L	SW846 8260B
Bromobenzene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
n-Butylbenzene	ND	1.0	ug/L	SW846 8260B
sec-Butylbenzene	ND	1.0	ug/L	SW846 8260B
tert-Butylbenzene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Chlorodibromomethane	ND	1.0	ug/L	SW846 8260B

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: TRNC/D-7 **Work Order #...:** KDAJ31AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
2-Hexanone	ND	5.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
Isopropylbenzene	ND	1.0	ug/L	SW846 8260B
p-Isopropyltoluene	ND	1.0	ug/L	SW846 8260B
[redacted]	0.60 J	1.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
2-Nitropropane	ND	10	ug/L	SW846 8260B
n-Propylbenzene	ND	1.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,2,3-Trichlorobenzene	ND	1.0	ug/L	SW846 8260B
1,2,4-Trichloro-benzene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.0	ug/L	SW846 8260B
1,2,4-Trimethylbenzene	ND	1.0	ug/L	SW846 8260B
1,3,5-Trimethylbenzene	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	3.0	ug/L	SW846 8260B
[redacted]	ND	2.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	2.0	ug/L	SW846 8260B
1,3,5-Trichlorobenzene	ND	5.0	ug/L	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	5.0	ug/L	SW846 8260B
[redacted] (Freon 12)	ND	2.0	ug/L	SW846 8260B
[redacted]	ND	5.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	10	ug/L	SW846 8260B
[redacted]	ND	10	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B
[redacted]	ND	1.0	ug/L	SW846 8260B

(Continued on next page)

LDC #: 18100F1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: 1

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/kg) 1	Concentration (µg/kg) 2	D ~~RPD~~
F	8.1	6.4	1.T (≤2) NoQual

Compound	Concentration (µg/kg) 6	Concentration (µg/kg) T	D ~~RPD~~
F	0.14	14	T (≤2) NoQual
DDD	5.2U	0.45	4.75 (≤5.2) ✓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

Semivolatiles

LDC Report# 18100A2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 23, 2008

Matrix: Soil/Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 13 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.

Raw data were not reviewed for this SDG. The review was 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-CJ-03-0'	All TCL compounds	17	14	J- (all detects) UJ (all non-detects)	A

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).

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
11/20/07 (ICAL1990)	Benzoic acid	28.03619	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CR-07-0'MS TSB-CR-07-0'MSD 7318065MB	J+ (all detects)	A
11/20/07 (ICAL1992)	N-(Hydroxymethyl)phthalimide	28.48742	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CR-07-0'MS TSB-CR-07-0'MSD 7318065MB	J+ (all detects)	A
11/21/07 (ICAL2035)	N-(Hydroxymethyl)phthalimide	29.40416	TSB-CJ-03-10'	J+ (all detects)	A
11/20/07 (ICAL2011)	N-(Hydroxymethyl)phthalimide	40.96823	RINSATE 1 RINSATE 1MS RINSATE 1MSD 7318085MB	J+ (all detects)	A

The percent difference (%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
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1 TSB-CR-07-0'MS TSB-CR-07-0'MSD RINSATE 1MS RINSATE 1MSD 7318065MB 7318085MB	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1 TSB-CR-07-0'MS TSB-CR-07-0'MSD RINSATE 1MS RINSATE 1MSD 7318065MB 7318085MB	J+ (all detects)	A

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.

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 MSD percent recovery (%R) and relative percent difference (RPD) was not within QC limits for some compounds, the MS or LCS percent recoveries (%R) and relative percent differences (RPD) 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 recoveries (%R) were 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 were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD			
Hexachlorobenzene	35	340U	305 (≤340)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CJ-03-0'	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' RINSATE 1	Benzoic acid N-(Hydroxymethyl)phthalimide	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-03-10'	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A2
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/15/08
Page: 1 of 1
Reviewer: 9
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
I.	Technical holding times	SW	Sampling dates: 11/9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD. r²
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	1 = 3+4
XVII.	Field blanks	ND	R = 12

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:

1	TSB-CR-07-0'	S	11	TSB-CJ-03-10'	S	21	7318065MB	31	S
2	TSB-CR-07-10'		12	RINSATE 1	W	22	7318085MB	32	
3	TSB-CJ-08-0'		13	TSB-CR-07-0'MS	S	23	7330071MB	33	S
4	TSB-CJ-08-0'-FD		14	TSB-CR-07-0'MSD	↓	24		34	
5	TSB-CJ-08-10'		15	RINSATE 1MS	W	25		35	
6	TSB-CJ-04-0'		16	RINSATE 1MSD	↓	26		36	
7	TSB-CJ-04-10'		17			27		37	
8	TSB-CJ-07-0'		18			28		38	
9	TSB-CJ-07-10'		19			29		39	
10	TSB-CJ-03-0'	✓	20			30		40	

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. N-Hydroxymethylphth
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. N-Hydroxymethylphthalimide
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18100A2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: A
2nd Reviewer: V

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
10	S	X	11-9-07	11-26-07	12-1-07	17	J-/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100A2
SDG #: See COVR

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/12/07	ICAL1887	X	$ 29.20492		1-9, 11-16	√ / A
		(ICV)	DDD	29.99656		731806SMB	√ + dets / A
						731808SMB	
	11/20/07	ICAL1990	PPP	28.03619		1-9, 13-14	√ + dets / A
	√	ICAL1992	UUU	28.48742		731806SMB	√
	11/28/07	ICAL2035	UUU	29.40416		~~12, 15-16~~ ~~3, 10~~ 731808SMB 11	√ + dets / A
	11/20/07	ICAL2011	UUU	40.96823		12, 15-16 731808SMB	√ + dets / A

CONCAL.2S

LDC #: 18100A2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: Q
2nd Reviewer: [signature]

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

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

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N (N/A) If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		TB18085MB	FBP	48 (50-100)	No qual
				( )	
				( )	
		12	TBP	47 (49-96)	✓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94
S5 (2FP)= 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 18110A2
SDG #: See COC

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: 9
2nd Reviewer: 12

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.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A 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	Qualifications
		13/14	RPD	outside gw General qpdc		( )	1	No Qual
				( )	( )	( )		(70R in)
			HH	( )	6.0 (40-104)	( )		No Qual (LCS in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 18100A2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7318065LCS	DDD	101 (46-97)	( )	( )	1-9, 11, 7318065MB	No LCS/LCSD (MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		7318085LCS	K	28 (30-77)	( )	( )	All Hazlo	No LCS/LCSD
			U	29 (30-86)	( )	( )	7318085MB	
			X	27 (35-104)	( )	( )		
			DDD	97 (43-95)	( )	( )		
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100A2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer:

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds identified in the field duplicate pairs?

Compound	Concentration (ug/kg)		RPD
	3	4	
55	35	340U	305 (≤ 340) No Qual

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 23, 2008

Matrix: Soil

Parameters: Semivolatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil 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).

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
11/20/07 (ICAL2011)	N-(Hydroxymethyl)phthalimide	40.96823	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7319097MB	J+ (all detects)	A
11/21/07 (ICAL2035)	N-(Hydroxymethyl)phthalimide	29.40416	TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	J+ (all detects)	A

The percent difference (%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
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	All samples in SDG TRNC-D-2	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	All samples in SDG TRNC-D-2	J+ (all detects)	A

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.

No field blanks were identified in this SDG.

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. Although the LCS percent recoveries (%R) were 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 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)

Tentatively identified compounds were not reported by the laboratory.

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-CJ-06-0' and TSB-CJ-06-0'-FD and samples TSB-CJ-01-0'** and TSB-CJ-01-0'-FD** were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD			
Octachlorostyrene	340U	39	301 (≤340)	-	-
Hexachlorobenzene	340U	330	10 (≤340)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B2 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/22/08
SDG #: TRNC-D-2 Level III/IV Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: MM

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
I.	Technical holding times	A	Sampling dates: 11/12/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD. 1 2
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3 4 5* . 14+15
XVII.	Field blanks	N	

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

MS: 9

1	TSB-CJ-02-0'**	11	TSB-CR-03-10'	21	731909TMB	31	
2	TSB-CJ-02-10'**	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0'**	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10'**	14	TSB-CJ-06-0'	24		34	
5	TSB-CJ-01-0'-FD**	15	TSB-CJ-06-0'-FD	25		35	
6	TSB-CR-02-0'**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19		29		39	
10	TSB-CR-03-0'	20		30		40	

LDC #: 18100B2
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: W

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
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 $\geq$ 0.990?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
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) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?		✓		
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.		✓		
VI. Surrogate spikes				
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?			✓	
VII. 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.	✓			
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?	✓			

LDC #: 18100B2
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 1
2nd Reviewer: 2

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?		✓		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
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?	✓			
XI. Target compound identification				
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?	✓			
XII. 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?	✓			
XIII. Tentatively identified compounds (TICs)				
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 required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. Acetophenone
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Pentachlorobenzene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV. Benzenethiol
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW. phthalic acid

XXX. phenyl sulfide YYY. phenyl disulfide ZZZ. 4-chlorophenyl sulfone
AAAA. N-(Hydroxymethyl)pthalimide

LDC #: 18100B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/12/07	ICAL188T	X	-9.20492		All + Blk	J- (All) / A
		(ICV)	DDD	-9.99656			J+ detects / A
	11/20/07	ICAL2011	AAAA	40.96823		1-9, 11-18 Blk	J+ detects / B
	11/21/07	ICAL2035	AAAA	-9.40416		10-16	J+ detects / B

CONCAL1S

LDC #: 18100B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
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".

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7319097LCS	DDD	110 (46-97)	( )	( )	All + BK	No Qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: B100B2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: A
2nd reviewer: VV

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds identified in the field duplicate pairs?

Compound	Concentration (ug/Kg)		D ~~RPD~~
	14	15	
Detachlorostyrene	340 U	39	301 (≤340) No Cal
SS	↓	330	10 ↓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18100B2
SDG #: Sec0104

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: CA
2nd Reviewer: LN

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

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 = $(A_x)(C_{is})/(A_{is})(C_x)$
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_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/12/07	Phenol (1st internal standard)	1.96340	1.96340	1.88172	1.88172	3.89423	3.8942
			Naphthalene (2nd internal standard)	1.10806	1.10806	1.07477	1.07477	4.5600	45600
			Fluorene (3rd internal standard)	1.43536	1.43536	1.37592	1.37592	4.84529	4.8230
			~~Pentachlorophenol~~ (4th internal standard) UU	1.30164	1.30164	1.28737	1.28737	3.33115	3.39315
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.89601	0.8960	0.87134	0.87134	3.96949	3.9694
			Benzo(a)pyrene (6th internal standard)	1.23661	1.2366	1.19442	1.19442	3.34875	3.3486
2	ICAL	11/19/07	~~Phenol~~ (1st internal standard) TTT	0.47806	0.47806	0.47070	0.47070	1.61662	1.6163
			~~Naphthalene~~ (2nd internal standard) UUU	0.49114	0.49114	0.47988	0.47988	2.70619	2.7061
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3	ICAL	1/19/07	~~Phenol~~ (1st internal standard) VVV	2.28635	2.28635	2.22555	2.22555	1.99529	1.9953
			~~Naphthalene~~ (2nd internal standard) WWW	0.09032	0.09032	0.89089	0.89089	3.35902	3.3571
			~~Fluorene~~ (3rd internal standard) XXX	1.37927	1.37927	1.34098	1.34098	2.13517	2.1352
			~~Pentachlorophenol~~ (4th internal standard) YYY	0.60062	0.60062	0.56980	0.56980	6.57166	6.5788
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) ZZZ	0.67224	0.67224	0.66380	0.66380	1.55063	1.55063
			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 #: 18100B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

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

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ICAL2010	11/20/07	Phenol (1st internal standard)	1.88172	1.98522	1.98522	5.50052	5.5004
			Naphthalene (2nd internal standard)	1.06477	1.10713	1.10713	3.01138	3.01097
			Fluorene (3rd internal standard)	1.37592	1.44199	1.44199	5.74686	5.7592
			~~Pentachlorophenol~~ (4th internal standard) UU	1.28737	1.29725	1.29725	0.76705	0.76711
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.87134	0.87666	0.87666	0.61101	0.61088
			Benzo(a)pyrene (6th internal standard)	1.19442	1.25706	1.22706	2.73259	2.7329
2	ICAL2011	11/20/07	~~Phenol~~ (1st internal standard) TTT	0.47070	0.48253	0.48253	2.51243	2.5124
			~~Naphthal~~ene (2nd internal standard) UUU	0.47988	0.48824	0.48824	1.74197	1.74266
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	ICAL2012	11/20/07	~~Phenol~~ (1st internal standard) VVV	2.22555	2.2487	2.2487	1.03995	1.04007
			~~Naphthalene~~ (2nd internal standard) WWW	0.09089	0.09220	0.09220	1.43511	1.43866
			~~Fluorene~~ (3rd internal standard) XXX	1.34098	1.39238	1.39238	3.83251	3.8327
			~~Pentachlorophenol~~ (4th internal standard) YYY	0.56980	0.60042	0.60042	5.33533	5.3537
			~~Bis(2-ethylhexyl)phthal~~ate (5th internal standard) ZZZ	0.66380	0.68125	0.68125	2.62958	2.6290
			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 #: 18100B2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: W

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

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	34.0646	60		
2-Fluorobiphenyl		35.7341	63		
Terphenyl-d14		45.9166	89		
Phenol-d5	75	53.5375	68		
2-Fluorophenol		50.8759	62		
2,4,6-Tribromophenol		48.2973	71		
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	30.0275	60	60	0
2-Fluorobiphenyl		31.7528	63	63	
Terphenyl-d14		44.7055	89	89	
Phenol-d5	75	50.7872	68	68	
2-Fluorophenol		46.7976	62	62	
2,4,6-Tribromophenol		53.3847	71	71	
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 #: 18100B32
SDG #: See CLW

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: [illegible]

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

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 concentation

RPD = I MS - MSD I * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 17/18

Compound	Spike Added (MS/MSD)		Sample Concentration (MS)	Spiked Sample Concentration (MS/MSD)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3380	3380	ND	2310	2220	68	68	66	66	3.8	4.0
N-Nitroso-di-n-propylamine	↓	↓	↓	2570	2490	76	76	74	74	3.3	3.2
4-Chloro-3-methylphenol				2530	2530	75	75	75	75	0.04	0
Acenaphthene				2580	2530	76	76	75	75	1.8	2.0
Pentachlorophenol				2080	2200	62	62	65	65	5.5	5.6
Pyrene	↓	↓	↓	2790	2910	83	83	86	86	4.1	4.2

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 #: 15100B2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 1a

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

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 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7319097

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3330	NA	2270	NA	68	68				
N-Nitroso-di-n-propylamine	↓	↓	2550	↓	77	77				
4-Chloro-3-methylphenol			2430		73	73				
Acenaphthene			2460		74	74				
Pentachlorophenol			2400		72	72				
Pyrene			2790		84	84				

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 #: 18100B2
SDG #: SeaCOM

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: V

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

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

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

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

I_s = Amount of internal standard added in nanograms (ng)

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

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1-6, ND:

Conc. = ( )( )( )( )( ) / ( )( )( )( )( )

=

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 5, 2008

Matrix: Soil/Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2MS
TSB-DR-06-10'	RINSATE-2MSD
TSB-DR-05-0'	
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

Introduction

This data review covers 19 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.

Raw data were not reviewed for this SDG. The review was 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).

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
11/20/07 (ICAL2011)	N-(Hydroxymethyl)phthalimide	40.96823	7319097MB	J+ (all detects)	A

The percent difference (%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
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' 7319097MB 7320067MB	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' 7319097MB 7320067MB	J+ (all detects)	A
11/27/07 (ICAL2111)	Hexachlorocyclopentadiene	27.65129	TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2 RINSATE-2MS RINSATE-2MSD 7323118MB	J- (all detects) UJ (all non-detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/27/07 (ICAL2111)	Chrysene	31.22409	TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2 RINSATE-2MS RINSATE-2MSD 7323118MB	J+ (all detects)	A

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.

Sample RINSATE-2 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. 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. Although the LCS percent recoveries (%R) were 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 were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

LDC #: 18100C2
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/31/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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
I.	Technical holding times	A	Sampling dates: 11/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ∴ Y²
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 3+4
XVII.	Field blanks	ND	R=18

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:

1	TSB-DR-06-0'	S	11	TSB-DR-04-10'	S	21	RINSATE-2MS	W	31	T31909TMB	S
2	TSB-DR-~~06-10~~ 10		12	TSB-CR-04-0'		22	RINSATE-2MSD		32	T320067MB	
3	TSB-DR-05-0'		13	TSB-CR-04-10'		23			33	T323118MB	
4	TSB-DR-05-0'-FD		14	TSB-CR-05-0'		24			34		
5	TSB-DR-05-10'		15	TSB-CR-05-10'		25			35		
6	TSB-DR-03-0'		16	TSB-CR-06-0'		26			36		
7	TSB-DR-03-10'		17	TSB-CR-06-10'		27			37		
8	TSB-DJ-01-0'		18	RINSATE-2	W	28			38		
9	TSB-DJ-01-10'		19	TSB-DR-03-0'MS	S	29			39		
10	TSB-DR-04-0'		20	TSB-DR-03-0'MSD		30			40		

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. N-Hydroxymethylphthalimide
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18100C2
SDG #: See COVER

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
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".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/13/0T	ICAL188T	X	29.20492		1-14. 7319097MB	√-/UJ/A
		(ICV)	DDD	29.99656		7320067MB	√dets/A
	11/17/0T	ICAL2011	X	27.65129		15-18. 21-22	√-/UJ/A
		(ICV)	DDD	31.22409		7323118MB	√dets/A
	11/20/0T	ICAL2011	TTT	40.96823		~~14. 7320067MB~~ 7319097MB	√dets/A

CONCAL2S

LDC #: 18100C1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y (N) N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		Y323118MB	FBP	45 (50-100)	No Qual
			TBP	48 (55-103)	✓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94
S5 (2FP)= 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 18100C2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JT
2nd Reviewer: L

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 Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T31909TLCS	DDD	110 (46-97)	( )	( )	1-5.T31909TMB	No Qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
		T32006TLCS	DDD	107 46-97	( )	( )	6-17.T32006TMB	No Qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 23, 2008

Matrix: Soil

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'

Introduction

This data review covers 16 soil 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.

Raw data were not reviewed for this SDG. The review was 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).

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
11/28/07 (ICAL2152)	Bis(2-chloroisopropyl)ether	25.06818	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J- (all detects) UJ (all non-detects)	A
11/28/07 (ICAL2152)	2,4-Dinitrophenol	29.26967	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J+ (all detects)	A
11/28/07 (ICAL 2154)	N-(Hydroxymethyl)phthalimide Phthalic acid	33.87537 25.37305	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A

The percent difference (%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
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	7320067MB	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	7320067MB	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/27/07 (ICAL2111)	Hexachlorocyclopentadiene	27.65129	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J- (all detects) UJ (all non-detects)	A
11/27/07 (ICAL2111)	Chrysene	31.22409	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J+ (all detects)	A

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.

No field blanks were identified in this SDG.

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 not within QC limits. Since there were no associated samples, no data were qualified.

VIII. 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	Compound	%R (Limits)	Associated Samples	Flag	A or P
7324092LCS	3,3'-Dichlorobenzidine	65 (18-58)	TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J+ (all detects)	P

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

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD			
N-(Hydroxymethyl)phthalimide	120	340U	220 (≤340)	-	-
Phenol	440	340U	100 (≤340)	-	-
Benzyl alcohol	340	340U	0 (≤340)	-	-
Acetophenone	62	340U	270 (≤340)	-	-
Di-n-butylphthalate	4700	47	4653 (≤340)	J (all detects)	A
Fluoranthene	41	340U	299 (≤340)	-	-
Chrysene	43	340U	297 (≤340)	-	-
Bis(2-ethylhexyl)phthalate	94	340U	246 (≤340)	-	-
Di-n-octylphthalate	280	210	70 (≤340)	-	-
Benzoic acid	230	1600U	1370 (≤1600)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Bis(2-chloroisopropyl)ether N-(Hydroxymethyl)phthalimide Phthalic acid	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
TRNC-D-4	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	2,4-Dinitrophenol	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	3,3'-Dichlorobenzidine	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Di-n-butylphthalate	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D2
SDG #: TRNC-D-4
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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
I.	Technical holding times	A	Sampling dates: 11/14/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD. r²
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%.
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	No spl assʼd - No Evaal
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 5+6 . 12+14*
XVII.	Field blanks	N	

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:
All Soil

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21	732006MB	31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22	732092MB	32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW-DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW-DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17		27		37	
8	TSB-FJ-05-0'	18		28		38	
9	TSB-FJ-05-10'	19		29		39	
10	TSB-DR-01-0'	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. N-(Hydroxymethyl)phthalimide
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Phthalic acid
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18100D2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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 Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/12/07	ICAL1887	X	29.20492		T32006TMB	J-/UV/A
		(ICV)	DDD	29.99656			V+dets/B
	11/27/07	ICAL2111	X	27.65129		All. T32409MB	J-/UV/A
		(ICV)	DDD	31.22409			V+dets/B
	11/28/07	ICAL2152	MMM	25.06818		T-16. T32409MB	J-/UV/B
			HH	29.36967			V+dets/B
	11/28/07	ICAL2154	UUU	25.37305			J-/UV/A
			TTT	33.85537			V

CONCAL2S

LDC #: 18100D2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
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".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T320067LCS	DDD	107 (46-97)	( )	( )	1-7. T320067MB	No Qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
		T324092LCS	BBB	65 (18-58)	( )	( )	8-16. T324092MB	J+dets/P
			DDD	111 46-97)	( )	( )		No Qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100D2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: W

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds identified in the field duplicate pairs?

Qual Parent

Compound	Concentration (ug/Kg) 5	6	D RPD
TTT	120	340 U	220 (≤340) No Qual
A	440	↓	100 ↓
BBB	340	↓	0 ↓
Acetophenone	62	↓	270 ↓
XX	4700	47	4653 (≤340) J det/A
YY	41	340 U	299 No Qual

Compound	Concentration ( )		RPD
DDD	43	↓	297 ↓
EEE	94	↓	246 ↓
FFF	280	210	70 (≤340) No Qual
PPP	230	1600 U	1370 (≤1600) ↓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC Report# 18100E2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 23, 2008

Matrix: Soil/Water

Parameters: Semivolatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-10'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**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 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).

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
11/28/07 (ICAL2152)	Bis(2-chloroisopropyl)ether	25.06818	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J- (all detects) UJ (all non-detects)	A
11/28/07 (ICAL2152)	2,4-Dinitrophenol	29.26967	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J+ (all detects)	A
11/28/07 (ICAL2154)	Phthalic acid N-(Hydroxymethyl)phthalimide	25.37307 33.87537	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A

The percent difference (%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
11/27/07 (ICAL2111)	Hexachlorocyclopentadiene	27.65129	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J- (all detects) UJ (all non-detects)	A
11/27/07 (ICAL2111)	Chrysene	31.22409	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J+ (all detects)	A

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.

Sample RINSATE-3 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/MSD percent recoveries (%R) and relative percent differences (RPD) were not within QC limits for some compounds, the LCS 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 recoveries (%R) were 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 were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FR-02-0'**	Perylene-d12	236275 (360694-1442774)	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
7325172MB	1,4-Dichlorobenzene-d4 Acenaphthene-d10	325869 (79986-319942) 626682 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-10-0'**	1,4-Dichlorobenzene-d4 Acenaphthene-d10	331563 (79986-319942) 637504 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-10-10'**	1,4-Dichlorobenzene-d4	343703 (79986-319942)	1,4-Dioxane	J (all detects)	P
	Naphthalene-d8	1300481 (316072-1264286)	3-Methylphenol	J (all detects)	
	Acenaphthene-d10	660472 (156643-626570)	4-Methylphenol	J (all detects)	
	Phenanthrene-d10	976657 (242634-970534)	Pyridine	J (all detects)	
			Phenol	J (all detects)	
			Aniline	J (all detects)	
			Bis(2-chloroethyl)ether	J (all detects)	
			2-Chlorophenol	J (all detects)	
			Benzyl alcohol	J (all detects)	
			2-Methylphenol	J (all detects)	
			Bis(2-chloroisopropyl)ether	J (all detects)	
			N-Nitroso-di-n-propylamine	J (all detects)	
			Hexachloroethane	J (all detects)	
			Phthalic acid	J (all detects)	
			4-Chlorobenzenethiol	J (all detects)	
			4-Chlorophenyl methyl sulfide	J (all detects)	
			Acetophenone	J (all detects)	
			2-Methylnaphthalene	J (all detects)	
			Nitrobenzene	J (all detects)	
			Isophorone	J (all detects)	
			2-Nitrophenol	J (all detects)	
			2,4-Dimethylphenol	J (all detects)	
			Bis(2-chloroethoxy)methane	J (all detects)	
			Benzoic acid	J (all detects)	
			Naphthalene	J (all detects)	
			4-Chloroaniline	J (all detects)	
			Hexachlorobutadiene	J (all detects)	
			4-Chloro-3-methylphenol	J (all detects)	
			1,2,4,5-Tetrachlorobenzene	J (all detects)	
			N-(Hydroxymethyl)phthalimide	J (all detects)	
			Phenyl sulfide	J (all detects)	
			Hexachlorocyclopentadiene	J (all detects)	
			2,4,6-Trichlorophenol	J (all detects)	
			2,4,5-Trichlorophenol	J (all detects)	
			2-Chloronaphthalene	J (all detects)	
			2-Nitroaniline	J (all detects)	
			Dimethylphthalate	J (all detects)	
			Acenaphthylene	J (all detects)	
			2,6-Dinitrotoluene	J (all detects)	
			3-Nitroaniline	J (all detects)	
			Acenaphthene	J (all detects)	
			2,4-Dinitrophenol	J (all detects)	
			4-Nitrophenol	J (all detects)	
			Dibenzofuran	J (all detects)	
			Pentachlorobenzene	J (all detects)	
			2,4-Dinitrotoluene	J (all detects)	
			Diethylphthalate	J (all detects)	
			Fluorene	J (all detects)	
			4-Chlorophenyl-phenyl ether	J (all detects)	
			4-Nitroaniline	J (all detects)	
			1,2-Diphenylhydrazine (as Azobenzene)	J (all detects)	
			Phenyl disulfide	J (all detects)	
			Phenyl sulfone	J (all detects)	
			Benzenethiol	J (all detects)	
			Di-n-butylphthalate	J (all detects)	

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-04-0'**	1,4-Dichlorobenzene-d4 Acenaphthene-d10	340853 (79986-319942) 639235 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P

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)

Tentatively identified compounds were not reported by the laboratory.

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'**	Bis(2-chloroisopropyl)ether Phthalic acid N-(Hydroxymethyl)phthalimide	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'**	2,4-Dinitrophenol	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'**	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FR-02-0'**	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-5	TSB-FR-02-0'**	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Internal standards (area)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-0'** TSB-FJ-04-0'**	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P	Internal standards (area)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-10'**	1,4-Dioxane	J (all detects)	P	Internal standards (area)
		3-Methylphenol	J (all detects)		
		4-Methylphenol	J (all detects)		
		Pyridine	J (all detects)		
		Phenol	J (all detects)		
		Aniline	J (all detects)		
		Bis(2-chloroethyl)ether	J (all detects)		
		2-Chlorophenol	J (all detects)		
		Benzyl alcohol	J (all detects)		
		2-Methylphenol	J (all detects)		
		Bis(2-chloroisopropyl)ether	J (all detects)		
		N-Nitroso-di-n-propylamine	J (all detects)		
		Hexachloroethane	J (all detects)		
		Phthalic acid	J (all detects)		
		4-Chlorobenzenethiol	J (all detects)		
		4-Chlorophenyl methyl sulfide	J (all detects)		
		Acetophenone	J (all detects)		
		2-Methylnaphthalene	J (all detects)		
		Nitrobenzene	J (all detects)		
		Isophorone	J (all detects)		
		2-Nitrophenol	J (all detects)		
		2,4-Dimethylphenol	J (all detects)		
		Bis(2-chloroethoxy)methane	J (all detects)		
		Benzoic acid	J (all detects)		
		Naphthalene	J (all detects)		
		4-Chloroaniline	J (all detects)		
		Hexachlorobutadiene	J (all detects)		
		4-Chloro-3-methylphenol	J (all detects)		
		1,2,4,5-Tetrachlorobenzene	J (all detects)		
		N-(Hydroxymethyl)phthalimide	J (all detects)		
		Phenyl sulfide	J (all detects)		
		Hexachlorocyclopentadiene	J (all detects)		
		2,4,6-Trichlorophenol	J (all detects)		
		2,4,5-Trichlorophenol	J (all detects)		
		2-Chloronaphthalene	J (all detects)		
		2-Nitroaniline	J (all detects)		
		Dimethylphthalate	J (all detects)		
		Acenaphthylene	J (all detects)		
		2,6-Dinitrotoluene	J (all detects)		
		3-Nitroaniline	J (all detects)		
		Acenaphthene	J (all detects)		
		2,4-Dinitrophenol	J (all detects)		
		4-Nitrophenol	J (all detects)		
		Dibenzofuran	J (all detects)		
		Pentachlorobenzene	J (all detects)		
		2,4-Dinitrotoluene	J (all detects)		
		Diethylphthalate	J (all detects)		
		Fluorene	J (all detects)		
		4-Chlorophenyl-phenyl ether	J (all detects)		
		4-Nitroaniline	J (all detects)		
		1,2-Diphenylhydrazine (as	J (all detects)		
		Azobenzene)	J (all detects)		
		Phenyl disulfide	J (all detects)		
		Phenyl sulfone	J (all detects)		
		Benzenethiol	J (all detects)		
		Di-n-butylphthalate	J (all detects)		

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E2 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/22/08
SDG #: TRNC-D-5 Level III/IV Page: 1 of 1
Laboratory: Test America Reviewer: Q
2nd Reviewer: W

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
I.	Technical holding times	A	Sampling dates: 11/15/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD .12
IV.	Continuing calibration/ICV	SW	ICV 2570
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D=1+2. 8+9
XVII.	Field blanks	ND	R= 17

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

1	X	TSB-FJ-03-0'**	S	11	X	TSB-FR-02-0'**	S	21	7323118M13
2	X	TSB-FJ-03-0'-FD**		12		TSB-FR-02-10'**		22	X 7324092M13
3	X	TSB-FJ-03-10'**		13		TSB-FJ-09-0'**		23	1 7325724M13
4	1	TSB-FJ-10-0'**		14		TSB-FJ-09-10'**		24	
5	1	TSB-FJ-10-10'**		15		TSB-FR-03-0'**		25	
6	1	TSB-FJ-04-0'**		16		TSB-FR-03-10'**		26	
7	1	TSB-FJ-04-10'**		17		RINSATE-3	W	27	
8	1	TSB-FJ-02-0'**		18	X	TSB-FR-02-0'MS	S	28	
9	1	TSB-FJ-02-0'-FD**		19	X	TSB-FR-02-0'MSD		29	
10	1	TSB-FJ-02-10'**		20				30	

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LDC #: 18100E2
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: CY
2nd Reviewer: JV

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
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?	✓			
IV. Continuing calibration				
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?		✓		
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.		✓		
VI. Surrogate spikes				
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?			✓	
VII. 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.	✓			
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?	✓			

LDC #: 18100C2
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: V

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?		✓		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
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?	✓			
XI. Target compound identification				
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?	✓			
XII. 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?	✓			
XIII. Tentatively identified compounds (TICs)				
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 required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. Acetophenone
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Pentachlorobenzene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV. Benzenethiol
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW. Phthalic acid

XXX. Phenyl sulfide YYY. Phenyl disulfide ZZZ. 4-chlorophenyl sulfone
AAAA. N-(Hydroxymethyl)phthalimide

LDC #: 18100E2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/27/07	ICAL2111 (ICV)	X	27.65729		~~1-3.11.18-19~~	J- / UV / A
			DDD	31.22409		T32409-MB	J+ dets / A
						~~T32617-MB~~	
	11/28/07	ICAL2152	MMM	25.06818		1-3.11.18-19	J- / UV / A
			HH	29.26967		T32409-MB	J+ dets / A
	11/28/07	ICAL2164	WWW	25.37307			J- / UV / A
			~~AAA~~ A	33.85537			↓

CONCAL1S

LDC #: 18100C2

SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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

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

Y (N) N/A — Were percent recoveries (%R) for surrogates within QC limits?

Y N (N/A) — If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?

Y N (N/A) — If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		~~FBP~~	~~FBP~~	( )	
				( )	
		T323118MB	FBP	45 (50-100)	No qual
			TBP	48 (55-103)	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94
S5 (2FP)= 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 18100B2
SDG #: 3 recover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A 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	Qualifications
		18/19	T	10 (14-72)	6.9 (14-72)	37 (≤30)	11	No Qual
			BB	15 (37-103)	14 (37-103)	( )		
			FF	17 (27-87)	15 (27-87)	( )		
			KKK	128 (26-120)	( )	( )		
			DDD	121 (22-120)	( )	( )		
			GGG	136 (34-110)	116 (34-110)	( )		
				( )	( )	( )		(ccc is)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 13100E2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
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".

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7324092LCS	BBB	65 (18-58)	( )	( )	1-11. 7324092MB	No Qual
			DDD	111 (46-97)	( )	( )		↓
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18/0022
SDG #: Second

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
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".

Y N N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

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

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		11	PRY	236275 (360694-1442774)		J/UJ/A
						(FFF → LLL)
		T32517MB	DCB	325869 (79986-319942)		J det/P
			ANT	626682 (156643-626570)		
		4	DCB	331563 (↓)		
			ANT	637504 (↓)		
		5	DCB	343703 (79986-319942)		
			NPT	1300481 (31672-126486)		
			ANT	660472 (156643-626570)		
			PHN	976657 (242634-970534)		
		6	DCB	340853 (↓)		
			ANT	639235 (↓)		

* QC limits are advisory

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10
IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: TRNC/D-5 **Work Order #...:** KCLDV1AA **Matrix.....:** WATER
MB Lot-Sample #: F7K190000-118

Prep Date.....: 11/19/07 **Analysis Time..:** 06:08
Analysis Date..: 11/28/07 **Prep Batch #...:** 7323118
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,4-Dioxane	ND	10	ug/L	SW846 8270C
3-Methylphenol & [illegible]	ND	20	ug/L	SW846 8270C
Benzenethiol	ND	10	ug/L	SW846 8270C
1,2-Diphenylhydrazine (as Azobenzene)	ND	10	ug/L	SW846 8270C
Phthalic acid	ND	1000	ug/L	SW846 8270C
Octachlorostyrene	ND	10	ug/L	SW846 8270C
Bis(p-chlorophenyl)-disul	ND	50	ug/L	SW846 8270C
N-(Hydroxymethyl)phthalim	ND	10	ug/L	SW846 8270C
Phenyl disulfide	ND	10	ug/L	SW846 8270C
Phenyl sulfide	ND	10	ug/L	SW846 8270C
Phenyl sulfone	ND	10	ug/L	SW846 8270C
4-Chlorobenzenethiol	ND	10	ug/L	SW846 8270C
4-Chlorophenyl sulfone	ND	10	ug/L	SW846 8270C
4-Chlorophenyl methyl sul	ND	50	ug/L	SW846 8270C
Pyridine	ND	20	ug/L	SW846 8270C
Phenol	ND	10	ug/L	SW846 8270C
Aniline	ND	10	ug/L	SW846 8270C
bis(2-Chloroethyl)-ether	ND	10	ug/L	SW846 8270C
2-Chlorophenol	ND	10	ug/L	SW846 8270C
Benzyl alcohol	ND	10	ug/L	SW846 8270C
2-Methylphenol	ND	10	ug/L	SW846 8270C
bis(2-Chloroisopropyl) ether	ND	10	ug/L	SW846 8270C
Acetophenone	ND	10	ug/L	SW846 8270C
N-Nitrosodi-n-propyl-amine	ND	10	ug/L	SW846 8270C
Hexachloroethane	ND	10	ug/L	SW846 8270C
2-Methylnaphthalene	ND	10	ug/L	SW846 8270C
Nitrobenzene	ND	10	ug/L	SW846 8270C
Isophorone	ND	10	ug/L	SW846 8270C
2-Nitrophenol	ND	10	ug/L	SW846 8270C
2,4-Dimethylphenol	ND	10	ug/L	SW846 8270C
bis(2-Chloroethoxy) methane	ND	10	ug/L	SW846 8270C
Benzoic acid	ND	50	ug/L	SW846 8270C
2,4-Dichlorophenol	ND	10	ug/L	SW846 8270C
Naphthalene	ND	10	ug/L	SW846 8270C
4-Chloroaniline	ND	10	ug/L	SW846 8270C

DCB NPT ANT PHN CRY

(Continued on next page)

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: TRNC/D-5 **Work Order #...:** KCLDV1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Hexachlorobutadiene	ND	10	ug/L	SW846 8270C
4-Chloro-3-methylphenol	ND	10	ug/L	SW846 8270C
1,2,4,5-Tetrachloro-benzene	ND	10	ug/L	SW846 8270C
Hexachlorocyclopenta-diene	ND	10	ug/L	SW846 8270C
2,4,6-Trichloro-phenol	ND	10	ug/L	SW846 8270C
2,4,5-Trichloro-phenol	ND	10	ug/L	SW846 8270C
2-Chloronaphthalene	ND	10	ug/L	SW846 8270C
2-Nitroaniline	ND	10	ug/L	SW846 8270C
Dimethyl phthalate	ND	10	ug/L	SW846 8270C
Acenaphthylene	ND	10	ug/L	SW846 8270C
2,6-Dinitrotoluene EE	ND	10	ug/L	SW846 8270C
3-Nitroaniline FF	ND	10	ug/L	SW846 8270C
Acenaphthene GG	ND	10	ug/L	SW846 8270C
2,4-Dinitrophenol HH	ND	50	ug/L	SW846 8270C
4-Nitrophenol II	ND	25	ug/L	SW846 8270C
Dibenzofuran JJ	ND	10	ug/L	SW846 8270C
Pentachlorobenzene	ND	10	ug/L	SW846 8270C
2,4-Dinitrotoluene KK	ND	10	ug/L	SW846 8270C
Diethyl phthalate LL	ND	10	ug/L	SW846 8270C
Fluorene MM	ND	10	ug/L	SW846 8270C
4-Chlorophenyl phenyl ether	ND	10	ug/L	SW846 8270C
4-Nitroaniline OO	ND	10	ug/L	SW846 8270C
N-Nitrosodiphenylamine QQ	ND	10	ug/L	SW846 8270C
Azobenzene	ND	10	ug/L	SW846 8270C
4-Bromophenyl phenyl ether RR	ND	10	ug/L	SW846 8270C
Hexachlorobenzene SS	ND	10	ug/L	SW846 8270C
Pentachlorophenol TT	ND	50	ug/L	SW846 8270C
Phenanthrene UU	ND	10	ug/L	SW846 8270C
Anthracene VV	ND	10	ug/L	SW846 8270C
Carbazole WW	ND	10	ug/L	SW846 8270C
Fluoranthene YY	ND	10	ug/L	SW846 8270C
Pyrene	ND	10	ug/L	SW846 8270C
Butyl benzyl phthalate	ND	10	ug/L	SW846 8270C
Benzo(a)anthracene	ND	10	ug/L	SW846 8270C
3,3'-Dichlorobenzidine	ND	50	ug/L	SW846 8270C
Chrysene	ND	10	ug/L	SW846 8270C
bis(2-Ethylhexyl) phthalate	ND	10	ug/L	SW846 8270C
Di-n-butyl phthalate → PHN XX	ND	10	ug/L	SW846 8270C

(Continued on next page)

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: TRNC/D-5 **Work Order #...:** KCLDV1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Di-n-octyl phthalate	ND	10	ug/L	SW846 8270C
Benzo(b)fluoranthene	ND	10	ug/L	SW846 8270C
Benzo(k)fluoranthene	ND	10	ug/L	SW846 8270C
Benzo(a)pyrene	ND	10	ug/L	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	10	ug/L	SW846 8270C
Benzo(ghi)perylene	ND	10	ug/L	SW846 8270C
Dibenzo(a,h)anthracene	ND	10	ug/L	SW846 8270C

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	30	(26 - 67)
Phenol-d5	20	(19 - 45)
Nitrobenzene-d5	49	(45 - 96)
2-Fluorobiphenyl	45 *	(50 - 100)
2,4,6-Tribromophenol	48 *	(55 - 103)
Terphenyl-d14	55	(40 - 106)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

* Surrogate recovery is outside stated control limits.

LDC #: 18100227
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: LW

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

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/27/07	Phenol (1st internal standard)	2.07280	2.07280	1.96736	1.96736	9.48172	9.482
			Naphthalene (2nd internal standard)	1.13487	1.13487	1.08830	1.08830	8.38443	8.384
			Fluorene (3rd internal standard)	1.43505	1.43505	1.35666	1.35666	5.99156	5.992
			~~Pentachlorophenol~~ (4th internal standard) UU	1.28039	1.28039	1.24406	1.24406	3.23497	3.235
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.91037	0.91037	0.84240	0.84240	6.78812	6.7883
			Benzo(a)pyrene (6th internal standard)	1.23156	1.23156	1.17928	1.17928	8.11457	8.115
2	ICAL	11/27/07	~~Phenol~~ (1st internal standard) TTT	0.57820	0.57820	0.48862	0.48862	9.35547	9.3555
			~~Naphthalene~~ (2nd internal standard) UUU	0.46293	0.46293	0.46108	0.46108	6.35359	6.3538
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3	ICAL	11/27/07	~~Phenol~~ (1st internal standard) VVV	2.30581	2.30581	2.17013	2.17013	6.53712	6.5371
			~~Naphthalene~~ (2nd internal standard) WWW	0.19903	0.19903	0.19792	0.19792	9.17513	9.1739
			~~Fluorene~~ (3rd internal standard) XXX	1.37285	1.37285	1.30000	1.30000	4.78191	4.7820
			~~Pentachlorophenol~~ (4th internal standard) YYY	0.58495	0.58495	0.53076	0.53076	16.61464	16.615
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) ZZZ	0.73244	0.73244	0.69775	0.69775	4.18848	4.1888
			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 #: 18100E2
SDG #: See COVER

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: [illegible]

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

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (5 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/29/07	Phenol (1st internal standard)	1.90543	1.90543	1.8621	1.8621	15.0726	15.0726
			Naphthalene (2nd internal standard)	1.05271	1.0527	1.0437	1.0437	16.4617	16.4621
			Fluorene (3rd internal standard)	1.29796	1.29796	1.3123	1.3123	14.5116	14.5111
			~~Pentachlorophenol~~ (4th internal standard) UU	1.25095	1.25095	1.2417	1.2417	13.5838	13.5813
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.92542	0.92542	0.8648	0.8648	8.78944	8.78946
			Benzo(a)pyrene (6th internal standard)	1.17974	1.17974	1.1833	1.1833	5.13549	5.13555
2	ICAL	11/30/07	~~Phenol~~ (1st internal standard) TTT	0.45894	0.45894	0.4520	0.4520	19.72310	19.72333
			~~Naphthalene~~ (2nd internal standard) UUU	0.47536	0.47536	0.4734	0.4734	7.07575	7.07560
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			~~Phenol~~ (1st internal standard) VVV	2.23699	2.23699	2.1754	2.1754	14.21410	14.21339
			~~Naphthalene~~ (2nd internal standard) WWW	0.12756	0.12756	0.1260	0.1260	5.62069	5.61990
			~~Fluorene~~ (3rd internal standard) XXX	1.27406	1.27406	1.2453	1.2453	14.01629	14.01662
			~~Pentachlorophenol~~ (4th internal standard) YYY	0.50728	0.50728	0.5107	0.5107	10.06502	10.06588
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) ZZZ	0.68457	0.68457	0.6697	0.6697	11.49026	11.48988
			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 #: 18100227
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: V

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

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 = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ICAL2152	11/28/07	Phenol (1st internal standard)	1.96736	1.88514	1.88514	4.17922	4.1793
			Naphthalene (2nd internal standard)	1.08830	1.11062	1.11062	2.05092	2.0507
			Fluorene (3rd internal standard)	1.35666	1.41757	1.41757	4.49026	4.490
			~~Pentachlorophenol~~ (4th internal standard) UU	1.24406	1.26991	1.26991	2.07798	2.079
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.84240	0.80891	0.80891	3.97459	3.9750
			Benzo(a)pyrene (6th internal standard)	1.17928	1.22762	1.22762	4.09838	4.098
2	ICAL2153	11/28/07	~~Phenol~~ (1st internal standard) TTT	0.48862	0.49604	0.49604	1.51702	1.517
			~~Naphthalene~~ (2nd internal standard) UUU	0.46108	0.50971	0.50971	10.54877	10.548
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	ICAL2154	11/28/07	~~Phenol~~ (1st internal standard) VVV	2.17013	2.22247	2.22247	2.41163	2.412
			~~Naphthalene~~ (2nd internal standard) WWW	0.12792	0.09546	0.09546	25.37305	25.375
			~~Fluorene~~ (3rd internal standard) XXX	1.30000	1.38319	1.38319	6.39862	6.3989
			~~Pentachlorophenol~~ (4th internal standard) YYY	0.53076	0.60758	0.60758	14.47369	14.479
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) ZZZ	0.69775	0.67304	0.67304	3.54165	3.5412
			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 #: 18100 22
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer:

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

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
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ICAL2227	11/30/07	Phenol (1st internal standard)	1.86211	1.90982	1.90982	2.56226	2.5622
			Naphthalene (2nd internal standard)	1.04379	1.05853	1.05853	1.41191	1.4119
			Fluorene (3rd internal standard)	1.31323	1.30018	1.30018	0.99350	0.9937
			~~Pentachlorophenol~~ (4th internal standard) UU	1.24174	1.24234	1.24234	0.04778	0.4801
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.86485	0.92365	0.92365	6.79795	6.7984
			Benzo(a)pyrene (6th internal standard)	1.11833	1.17264	1.17264	4.85619	4.8563
2	ICAL2228	11/30/07	~~Phenol~~ (1st internal standard) TTT	0.45720	0.45674	0.45674	0.10013	0.10122
			~~Naphthalene~~ (2nd internal standard) UUU	0.47347	0.49069	0.49009	3.51110	3.5106
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	ICAL2229	11/30/07	~~Phenol~~ (1st internal standard) VVV	2.17152	2.24705	2.24705	3.47759	3.4775
			~~Naphthalene~~ (2nd internal standard) WWW	0.12600	0.12015	0.12015	4.64208	4.6448
			Fluorene (3rd internal standard) XXX	1.24533	1.27345	1.27345	2.25788	2.2579
			Pentachlorophenol (4th internal standard) YYY	0.51107	0.57632	0.57632	12.76732	1.2768
			Bis(2-ethylhexyl)phthalate (5th internal standard) ZZZ	0.66797	0.68968	0.68968	3.25066	3.250
			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 #: 18102Z2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: L

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

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	33.0839	66	66	0
2-Fluorobiphenyl	↓	37.2628	75	75	
Terphenyl-d14	↓	46.9939	94	94	
Phenol-d5	75	52.9072	71	71	
2-Fluorophenol	↓	50.607	67	67	
2,4,6-Tribromophenol	↓	63.3824	85	85	
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					

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 #: 18100222
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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

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 concentation

RPD = | MS - MSD | * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 18/19

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3390	3370	ND	2280	2150	67	67	64	64	6.0	5.9
N-Nitroso-di-n-propylamine				2440	2280	72	72	67	68	6.8	6.8
4-Chloro-3-methylphenol				2600	2460	77	77	73	73	5.6	5.5
Acenaphthene				2580	2480	76	76	74	74	4.0	4.0
Pentachlorophenol				3020	2910	89	89	86	86	3.5	3.7
Pyrene			1900	4630	3850	82	81	59	58	18	18

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 #: 810022
SDG #: 3a CDW

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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

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 * (SC/SA Where: SSC = Spike concentration; SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 732409

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3330	NA	2220	NA	67	67				
N-Nitroso-di-n-propylamine			2350		70	70				
4-Chloro-3-methylphenol			2350		71	71				
Acenaphthene			2500		75	75				
Pentachlorophenol			2460		74	74				
Pyrene			~~2590~~		~~7880~~	80				
			2680							

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 #: 81005E2
SDG #: Baker

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: V

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

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

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

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

I_s = Amount of internal standard added in nanograms (ng)

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

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 11 , S :

Conc. = $\frac{(26093)(40)(1000)(1)(\quad)}{(79396)(\cancel{1.05853})(30.7)(1)(0.976)}$

1.08830

$= 40.3\ \mu g/kg$

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

LDC Report# 18100F2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 23, 2008

Matrix: Soil/Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
RINSATE-4MS
RINSATE-4MSD

Introduction

This data review covers 17 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Sample	Compound	Total Time From DFTPP Tuning Until Analysis	Required Analysis Time (in Hours) From DFTPP Tuning Until Analysis	Flag	A or P
TSB-GJ-01-5'	All TCL compounds	12 hours 1 min.	12 hours	None	P

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).

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
12/11/07 (JCAL2820)	N-(Hydroxymethyl)phthalimide	25.66437	All water samples in SDG TRNC-D-6	J- (all detects) UJ (all non-detects)	A

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.

Sample RINSATE-4 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. 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. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
7325172MB	1,4-Dichlorobenzene-d4 Acenaphthene-d10	325869 (79986-319942) 626682 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P
TSB-FR-04-0'-FD	Perylene-d12 Chrysene-d12	97084 (266169-1064676) 141596 (249202-996806)	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Octachlorostyrene Bis(p-chlorophenyl)disulfide 4-Chlorophenyl sulfone Pyrene Butylbenzylphthalate Benzo(a)anthracene 3,3'-Dichlorobenzidine Chrysene Bis(2-ethylhexyl)phthalate	J (all detects) UJ (all non-detects)	P

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD			
Pyrene	40	300	260 (≤340)	-	-
Phenanthrene	95	960	865 (≤340)	J (all detects)	A
Fluoranthene	47	97	50 (≤340)	-	-
Chrysene	93	510	417 (≤340)	J (all detects)	A
Di-n-butylphthalate	340U	140	200 (≤340)	-	-
Benzo(a)anthracene	340U	96	244 (≤340)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-GJ-01-5'	All TCL compounds	None	P	GC/MS instrument performance check
TRNC-D-6	RINSATE-4	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TSB-FR-04-0'-FD	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Octachlorostyrene Bis(p-chlorophenyl)disulfide 4-Chlorophenyl sulfone Pyrene Butylbenzylphthalate Benzo(a)anthracene 3,3'-Dichlorobenzidine Chrysene Bis(2-ethylhexyl)phthalate	J (all detects) UJ (all non-detects)	P	Internal standards (area)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Phenanthrene Chrysene	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F2 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: TRNC-D-6 Level III Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

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
I.	Technical holding times	A	Sampling dates: 11/16/07
II.	GC/MS Instrument performance check	SW	
III.	Initial calibration	A	RSD. r²
IV.	Continuing calibration/ICV	SW	ICV = 25%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 5+6.
XVII.	Field blanks	ND	R = 16

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:

1 2	TSB-FJ-08-0'	11 2	TSB-GR-01-5'	21	T325214MB	31	W	
2 2	TSB-FJ-08-10'	12 2	TSB-GJ-06-0'	22 1	T325112MB	32		
3 2	TSB-FR-05-0'	13 2	TSB-GJ-06-5'	23	~~T325214MB~~	33		
4 2	TSB-FR-05-10'	14 2	TSB-GJ-01-0'	24		34		
5 2	TSB-FR-04-0'	15 2	TSB-GJ-01-5'	25		35		
6 2	TSB-FR-04-0'-FD	16	RINSATE-4 W	26		36		
7 2	TSB-FR-04-10'	17 1	TSB-FJ-01-0'MS S	27		37		
8 1	TSB-FJ-01-0'	18 1	TSB-FJ-01-0'MSD	28		38		
9 2	TSB-FJ-01-10'	19	RINSATE-4MS W	29		39		
10 2	TSB-GR-01-0'	20	RINSATE-4MSD	30		40		

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. N-Ethoxymethylphthalimide
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. 3,3'-Dimethylbenzidine
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18100f2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
GC/MS Performance Check

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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 the DFTPP performance results reviewed and found to be within the EPA Functional Guideline criteria?

Y (N) N/A Were all samples analyzed within the 12 hour clock criteria?

#	Laboratory ID	12 Hour Clock (Time/date)	Finding	Associated Samples Client ID	Qualifications
	15	0554/12/2/07	Analyzed @ 0554 (1 min out of 12 hr clock)	15	None A

m/z	ION ABUNDANCE CRITERIA	m/z	ION ABUNDANCE CRITERIA
51	30.0 - 60.0% of m/z 198	199	5.0 - 9.0% of m/z 198
68	Less than 2.0% of m/z 69	275	10.0 - 30.0% of m/z 198
69	Present	365	Greater than 1.0% of m/z 198
70	Less than 2.0% of 69	441	Present, but less than m/z 443
127	40.0 - 60.0% of m/z 198	442	Greater than 40.0% of m/z 198
197	Less than 1.0% of m/z 198	443	17.0 - 23.0% of m/z 442
198	Base peak, 100% relative abundance		

LDC #: 18110F2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	~~11/27/07~~	~~ICAL~~					
	~~11/30/07~~	~~ICAL2227~~					
	12/11/07	ICAL2820	TTT	25.66437		MW-20S, 7325KMB	✓ + dets / 18

CONCAL.2S

LDC #: 18100F2
SDG #: Beecover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: 9
2nd Reviewer:

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

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

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		732514MB	TBP	46 (49-96)	No Qual
				( )	
		5	TBP	20 (37-105)	
				( )	
		6	TPH	117 (34-105)	
				( )	
		7	TPH	117 ( )	
				( )	
		9	TPH	110 ( )	
				( )	
		10	TPH	111 ( )	
				( )	
		11	TPH	107 ( )	
				( )	
		12	TPH	115 ( )	
				( )	
		13	TPH	111 ( )	
				( )	
		14	TPH	111 ( )	
				( )	
		15	TPH	107 ( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP) = 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 18100F2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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 all internal standard area counts within -50 to +100 of the associated calibration standard?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		732572MB	DCB	325869 (79986-319942)		dets/P
			ANT	626682 (156643-626570)		↓
		6	~~NPT~~ PRY	97084 (26619-1064676)		J/M/P
			CRY	141596 (24920-996806)		↓
					(see R E)	

* QC limits are advisory

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10
IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

LDC #: 18100F2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: 1

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

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds identified in the field duplicate pairs?

Compound	Concentration (ug/kg) 5	6	D RPD
ZZ	40	300	260 (≤340) No Qual
UU	95	960	865 Vdets/A
YY	47	97	50 No Qual
DDD	93	510	417 Vdets/A
XX	340 U	140	200 No Qual
CCC	340 U	596	244 ↓ ↓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC Report# 18100G2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 23, 2008

Matrix: Soil/Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD

Introduction

This data review covers 16 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 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.

Raw data were not reviewed for this SDG. The review was 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).

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
12/11/07 (JCAL2842)	N-(Hydroxymethyl)phthalimide	40.70733	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	J- (all detects) UJ (all non-detects)	A

The percent difference (%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
12/11/07 (JCAL2820)	N-(Hydroxymethyl)phthalimide	25.66437	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' RINSATE-5 TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7325214MB	J+ (all detects)	A

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
12/11/07 (JCAL2842)	N-(Hydroxymethyl)phthalimide	0.03547 (≥0.05)	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	J (all detects) UJ (all non-detects)	A

V. Blanks

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

Sample RINSATE-5 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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-GJ-03-0'	2-Fluorophenol Phenol-d5 Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromophenol Terphenyl-d14	11 (41-87) 12 (40-94) 12 (41-91) 12 (44-96) 11 (37-105) 11 (34-105)	All TCL compounds	J- (all detects) UJ (all non-detects)	P

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. Internal Standards

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

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	N-(Hydroxymethyl)phthalimide	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' RINSATE-5	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	N-(Hydroxymethyl)phthalimide	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	TSB-GJ-03-0'	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Surrogate spikes (%R)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G2 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/22/08
SDG #: TRNC-D-7 Level III Page: 1 of 1
Laboratory: Test America Reviewer: 9
2nd Reviewer: 1

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
I.	Technical holding times	A	Sampling dates: 11/19/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD. Y 2
IV.	Continuing calibration/ICV	SW	ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 1 + 2 · 6 + 7
XVII.	Field blanks	ND	R = 15

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:

1	1	TSB-GR-02-0'	S	11	2	TSB-GJ-05-0'	S	21	1 T32514MB W	31	
2	1	TSB-GR-02-0'-FD		12	2	TSB-GJ-05-5'		22	3 T33007MB S	32	
3	1	TSB-GR-02-5'		13	2	TSB-GJ-03-0'		23		33	
4	1	TSB-GJ-04-0'		14	2	TSB-GJ-03-5'		24		34	
5	1	TSB-GJ-04-5'		15	1	RINSATE-5	W	25		35	
6	1	TSB-GJ-02-0'		16	1	TSB-GJ-04-0'MS	S	26		36	
7	1	TSB-GJ-02-0'-FD		17	1	TSB-GJ-04-0'MSD		27		37	
8	1	TSB-GJ-02-5'		18				28		38	
9	1	TSB-GJ-07-0'		19				29		39	
10	2	TSB-GJ-07-5'		20				30		40	

VALIDATION FINDINGS WORKSHEET

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

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. Butylbenzylphthalate	PPP. Benzoic Acid
I. 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	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. N-Hydroxymethylphthalimide
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. 3,3'-Dimethylbenzidine
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18100T2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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 Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	12/1/07	JCAL2820	TTT	25.6637		1-9, 15-17	J+ detects/A
						T3252LKMB	
	12/11/07	JCAL2842	TTT	40.7033		10-14	J/UJ/A
			TTT		0.0354T		J/UJ/10

CONCAL2S

LDC #: 18100F2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: T
2nd Reviewer: A

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

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

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N (N/A) If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		TB25214MB	TBP	46 (49-96)	No qual
				( )	
				( )	
		13	2FP	11 (41-87)	J- / UJ / P (all)
			PHL	12 (40-94)	
			NBZ	12 (41-91)	
			FBP	12 (44-96)	
			TBP	11 (37-105)	
			TPH	11 (34-105)	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP)= 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

Pesticides

LDC Report# 18100A3a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-0'DL
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'DL
TSB-CJ-08-0'-FD
TSB-CJ-08-0'-FDDL
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-0'DL
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-0'DL
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-0'DL
TSB-CJ-03-10'
TSB-CJ-03-10'DL
RINSATE 1
TSB-CR-07-10'MS
TSB-CR-07-10'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 20 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.

Raw data were not reviewed for this SDG. The review was based on QC data.

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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 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
All soil samples in SDG TRNC-D-1	All TCL compounds	21	14	J- (all detects) UJ (all non-detects)	P

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.

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
11/21/07	KCAL998	STX-CLP1	Heptachlor	31.3	All water samples in SDG TRNC-D-1	J+ (all detects)	P
			4,4'-DDE	15.3		J+ (all detects)	
			Dieldrin	17.0		J+ (all detects)	
			Endrin	23.4		J+ (all detects)	
			4,4'-DDD	17.8		J+ (all detects)	
			Endosulfan II	21.0		J+ (all detects)	
			4,4'-DDT	29.0		J+ (all detects)	
			methoxychlor	30.6		J+ (all detects)	
			Endosulfan sulfate	19.5		J+ (all detects)	
			Endrin ketone	16.2		J+ (all detects)	

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/3/07	KCAL554	STX-CLP1	Endrin ketone	16.6	TSB-CR-07-10'MS TSB-CR-07-10'MSD 7334483MB	J+ (all detects)	A
12/3/07	KCAL554	STX-CLP2	delta-BHC gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	15.6 16.0 17.5 16.3 19.7 19.1 21.2 22.6 18.9 21.2 21.1 19.4 17.5 24.0	TSB-CR-07-10'MS TSB-CR-07-10'MSD 7334483MB	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P
12/3/07	KCAL568	STX-CLP1	Endrin ketone	16.5	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	J+ (all detects)	A
12/3/07	KCAL568	STX-CLP2	delta-BHC Heptachlor Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	17.1 16.2 15.4 17.5 18.7 18.2 21.4 20.5 22.5 22.9 19.7 26.5 21.5 19.9 17.2 24.5	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P
12/3/07	KCAL584	STX-CLP1	Endosulfan sulfate Endrin ketone	25.0 18.0	TSB-CJ-03-0' TSB-CJ-03-10'	J+ (all detects) J+ (all detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/3/07	KCAL584	STX-CLP2	gamma-BHC	15.8	TSB-CJ-03-0'	J+ (all detects)	P
			delta-BHC	18.4	TSB-CJ-03-10'	J+ (all detects)	
			Heptachlor	15.3		J+ (all detects)	
			Aldrin	15.8		J+ (all detects)	
			Heptachlor epoxide	15.7		J+ (all detects)	
			gamma-Chlordane	18.2		J+ (all detects)	
			alpha-Chlordane	19.2		J+ (all detects)	
			Endosulfan I	19.2		J+ (all detects)	
			4,4'-DDE	21.5		J+ (all detects)	
			Dieldrin	21.0		J+ (all detects)	
			Endrin	22.0		J+ (all detects)	
			4,4'-DDD	21.4		J+ (all detects)	
			Endosulfan II	18.4		J+ (all detects)	
			4,4'-DDT	25.0		J+ (all detects)	
			Endrin aldehyde	21.2		J+ (all detects)	
			Endosulfan sulfate	19.9		J+ (all detects)	
			Methoxychlor	18.2		J+ (all detects)	
			Endrin ketone	28.3		J+ (all detects)	
12/11/07	KCAL015	STX-CLP2	4,4'-DDD	15.9	TSB-CR-07-10'	J+ (all detects)	A

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

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

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-CR-07-0'	STX-CLP1	Decachlorobiphenyl	980 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-08-10'	STX-CLP1	Decachlorobiphenyl	201 (57-144)	All TCL compounds	J+ (all detects)	P

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 (%R) were not within QC limits for one compound, the 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. 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

Raw data were not reviewed for this SDG.

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-CR-07-0'	beta-BHC 4,4'-DDE 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A
TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-04-0' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
TSB-CR-07-0'	gamma-Chlordane Endrin aldehyde	119.4 131.7	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD and samples TSB-CJ-08-0'DL and TSB-CJ-08-0'-FDDL were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
alpha-BHC	4.0	2.1	-	1.9 (≤1.8)	J (all detects)	A
beta-BHC	60	130	74 (≤50)	-	J (all detects)	A
4,4'-DDE	6.8	3.1	-	3.7 (≤1.8)	J (all detects)	A
4,4'-DDT	2.7	4.1	-	1.4 (≤1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'DL	TSB-CJ-08-0'-FDDL				
beta-BHC	63	140	-	77 (≤18)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-0'DL TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'DL TSB-CJ-08-0'-FD TSB-CJ-08-0'-FDDL TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-0'DL TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-0'DL TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-0'DL TSB-CJ-03-10' TSB-CJ-03-10'DL	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times
TRNC-D-1	RINSATE 1	Heptachlor 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT methoxychlor Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	Endrin ketone	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	delta-BHC Heptachlor Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CJ-03-0' TSB-CJ-03-10'	Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-03-0' TSB-CJ-03-10'	gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)
TRNC-D-1	TSB-CR-07-10'	4,4'-DDD	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CR-07-0'	All TCL compounds	J+ (all detects)	A	Surrogate spikes (%R)
TRNC-D-1	TSB-CJ-08-10'	All TCL compounds	J+ (all detects)	P	Surrogate spikes (%R)
TRNC-D-1	TSB-CR-07-0'	beta-BHC 4,4'-DDE 2,4'-DDE	J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-04-0' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-1	TSB-CR-07-0'	gamma-Chlordane Endrin aldehyde	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	alpha-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	beta-BHC	J (all detects)	A	Field duplicates (RPD)
TRNC-D-1	TSB-CJ-08-0'DL TSB-CJ-08-0'-FDDL	beta-BHC	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A3a
SDG #: TRNC/D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

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: 11/09/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D_1 = 4, 6 D_2 = 5, 7
XV.	Field blanks	ND	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: Soil + Water

1	TSB-CR-07-0' S	11	TSB-CJ-04-10' S	21	TSB-CR-07-10'MSD S	31	7334483 MB
2	TSB-CR-07-0'DL	12	TSB-CJ-07-0'	22	RINSATE 1MS W	32	7318/00 MB
3	TSB-CR-07-10'	13	TSB-CJ-07-0'DL	23	RINSATE 1MSD	33	
4	TSB-CJ-08-0' D_1	14	TSB-CJ-07-10'	24		34	
5	TSB-CJ-08-0'DL D_2	15	TSB-CJ-03-0'	25		35	
6	TSB-CJ-08-0'-FD D_1	16	TSB-CJ-03-0'DL	26		36	
7	TSB-CJ-08-0'-FDDL D_2	17	TSB-CJ-03-10'	27		37	
8	TSB-CJ-08-10'	18	TSB-CJ-03-10'DL	28		38	
9	TSB-CJ-04-0'	19	RINSATE 1 W	29		39	
10	TSB-CJ-04-0'DL	20	TSB-CR-07-10'MS S	30		40	

LDC #: 18100 A3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All soils	S	N	11/09/07	11/30/07	12/03-12/07	21	J-/UJ/P

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4' DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 18100 A3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 3
Reviewer: JVC
2nd Reviewer:

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

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

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

Y N N/A Were Evaluation mix standards run before initial calibration and before samples?

Y N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

Y N N/A Was at least one standard run daily to verify the working curve?

Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	11/21/07	KCAL 998	STX-CLP1	E (+)	31.3	( )	19, 22, 23, 7318100 MB	J+ dets/P
				J (+)	15.3	( )		
				I (+)	17.0	( )		
				K (+)	23.4	( )		
				M (+)	17.8	( )		
				L (+)	21.0	( )		
				O (+)	29.0	( )		
				P (+)	30.6	( )		
				N (+)	19.5	( )		
				Q (+)	16.2	( )		
						( )		
						( )		
	12/03/07	KCAL 554	STX-CLP1	Q (+)	16.6	( )	7334483 MB, 20, 21	J+ dets/A
			STX-CLP2	C (+)	15.6	( )		J+ dets/P
				T	16.0	( )		
				S	17.5	( )		
				H	16.3	( )		
				J	19.7	( )		
				I	19.1	( )		
				K	21.2	( )		
				M	22.6	( )		
				L	18.9	( )		
				O	21.2	( )		

A. alpha-BHC
B. beta-BHC
C. delta-BHC
D. gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. DB 608
DD. DB 1701
EE.
FF.
GG.
HH.
II.
JJ.

LDC #: 18100A3A
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVC
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

(Y) N N/A Were Evaluation mix standards run before initial calibration and before samples?
(Y) N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
(Y) N N/A Was at least one standard run daily to verify the working curve?
Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/03/07	KCAL 554	STX-CLP2	R (+)	21.1	( )	7334483 MB, 20, 21	J+ dets/P
cont'd from p. 1				N	19.4	( )	↓	↓
				P	17.5	( )		
				Q	24.0	( )		
						( )		
						( )		
	12/03/07	KCAL 568	STX-CLP1	Q (+)	16.5	( )	6, 8, 9, 11, 12	J+ dets/A
			STX-CLP2	C	17.1	( )		J+ dets/P
				E	16.2	( )		
				G	15.4	( )		
				T	17.5	( )		
				S	18.7	( )		
				H	18.2	( )		
				J	21.4	( )		
				I	20.5	( )		
				K	22.5	( )		
				M	22.9	( )		
				L	19.7	( )		
				O	26.5	( )		
				R	21.5	( )		
				N	19.9	( )		
				P	17.2	( )		
				Q	24.5	( )	↓	↓

A. alpha-BHC
B. beta-BHC
C. delta-BHC
D. gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. DB 608
DD. DB 1701
EE.
FF.
GG.
HH.
II.
JJ.

LDC #: 18100A7a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVC
2nd Reviewer: L

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

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

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

(Y) N N/A Were Evaluation mix standards run before initial calibration and before samples?

(Y) N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

(Y) N N/A Was at least one standard run daily to verify the working curve?

Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

Y N (N/A) Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/03/07	KCAL 584	STX-CLP1	N (+)	25.0	( )	15 17	J+ dets / A
				Q	18.0	( )	↓	↓
			STX-CLP2	D	15.8	( )		J+ dets / P
				C	18.4	( )		
				E	15.3	( )		
				F	15.8	( )		
				G	15.7	( )		
				T	18.2	( )		
				S	19.2	( )		
				H	19.2	( )		
				J	21.5	( )		
				I	21.0	( )		
				K	22.0	( )		
				M	21.4	( )		
				L	18.4	( )		
				O	25.0	( )		
				R	21.2	( )		
				N	19.9	( )		
				P	18.2	( )		
				Q ✓	28.3	( )	↓	↓
						( )		
	12/11/07	KCAL015	STX-CLP1	M (+)	15.9	( )	3	J+ dets / A
						( )		

A. alpha-BHC
B. beta-BHC
C. delta-BHC
D gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. DB 608
DD. DB 1701
EE. ____
FF. ____
GG. ____
HH. ____
II. ____
JJ. ____

LDC #: 18100A32
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 2
Reviewer: JVG
2nd Reviewer:

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

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

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?

Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		1	STX-CLP1	B	980 (57-144)	J+ dets / A
					( )	
		2 (10X)		A	DO (73-116)	No qual
				B	(57-144)	
					( )	
		4 (10X)		A	( )	
				B	( )	
					( )	
		6 (10X)		A	( )	
				B	( )	
					( )	
		8		B	201 ( )	J+ dets / P
					( )	
		10 (10X)		A	DO ( )	No qual
				B	( )	
					( )	
		13 (10X)		A	( )	
				B	( )	
		16 (10X)		A	( )	
			✓	B	( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100A3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 2
Reviewer: JVG
2nd Reviewer:

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

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

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?
Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		18 (10x)	5Tx-CLP1	A	DO (73-116)	No qual
				B	↓ (57-144)	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100A3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVC
2nd Reviewer:

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

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?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		20/21	L	146 (63-117)	130 (63-117)	( )	3	No qual (LCS in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18800A3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JVG
2nd Reviewer: [illegible]

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

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	B, J, EE	7 cal range	1	J dets /A
		↓		↓
	B		4, 6, 9, 12, 15, 17	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100A34
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JVL
2nd Reviewer: [illegible]

METHOD: /GC __HPLC

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

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y (N) N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	T	1	119.4	J (all TCL/A
	R	↓	131.7	↓

Comments: _____

LDC #: 18100A3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (Parent only)
	4	6	
A	4.0	2.1	1.9 (≤1.8 Diff) Jdets/A
B	60	130	74 (≤50% RPD)
J	6.8	3.1	3.7 (≤1.8 Diff)
O	2.7	4.1	1.4 —

Compound	Concentration (ug/kg)		RPD
	5	7	
B	63	140	77 (≤18 Diff) Jdets/A

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC Report# 18100B3a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 28, 2008

Matrix: Soil

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-0'DL**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CJ-01-0'-FDDL**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-0'DL
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-0'DL
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-0'-FDDL
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 23 soil 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.

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 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.

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

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.

No field blanks were identified in this SDG.

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
TSB-CJ-01-0'**	Decachlorobiphenyl	197 (57-144)	All TCL compounds	J+ (all detects)	P
TSB-CJ-05-0'	Decachlorobiphenyl	581 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-0'-FD	Decachlorobiphenyl	455 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-10'	Tetrachloro-m-xylene Decachlorobiphenyl	154 (73-116) 155 (57-144)	All TCL compounds	J+ (all detects)	P

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 one compound, the 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. 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 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-CJ-02-0'** TSB-CJ-01-0'-FD** TSB-CR-01-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-CJ-05-0'	alpha-BHC beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
TSB-CJ-01-0'**	2,4'-DDE	69.8	J (all detects)	A
TSB-CJ-01-0'-FDDL**	beta-BHC	46.2	J (all detects)	A
TSB-CR-01-0'DL	beta-BHC	46.3	J (all detects)	A
TSB-CJ-05-0'	Methoxychlor 2,4'-DDD	169.4 99.6	J (all detects) J (all detects)	A
TSB-CJ-05-0'DL	alpha-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	47.7 93.0 87.9 60.4	J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-02-0'DL**	beta-BHC	47.0	J (all detects)	A

Introduction

This data review covers 23 soil 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.

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.

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

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.

No field blanks were identified in this SDG.

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-CJ-01-0'**	STX-CLP1	Decachlorobiphenyl	197 (57-144)	All TCL compounds	J+ (all detects)	P
TSB-CJ-05-0'	STX-CLP1	Decachlorobiphenyl	581 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-0'-FD	STX-CLP1	Decachlorobiphenyl	455 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-10'	STX-CLP1	Tetrachloro-m-xylene Decachlorobiphenyl	154 (73-116) 155 (57-144)	All TCL compounds	J+ (all detects)	P

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 one compound, the 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. 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 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-CJ-02-0'** TSB-CJ-01-0'-FD** TSB-CR-01-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-CJ-05-0'	alpha-BHC beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
TSB-CJ-01-0'**	2,4'-DDE	69.8	J (all detects)	A
TSB-CJ-01-0'-FDDL**	beta-BHC	46.2	J (all detects)	A
TSB-CR-01-0'DL	beta-BHC	46.3	J (all detects)	A
TSB-CJ-05-0'	Methoxychlor 2,4'-DDD	169.4 99.6	J (all detects) J (all detects)	A
TSB-CJ-05-0'DL	alpha-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	47.7 93.0 87.9 60.4	J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-02-0'DL**	beta-BHC	47.0	J (all detects)	A

Sample	Compound	%D	Flag	A or P
TSB-CJ-06-0'-FD	Methoxychlor 2,4'-DDD	65.0 51.6	J (all detects) J (all detects)	A
TSB-CJ-06-0'-FDDL	beta-BHC 4,4'-DDE	42.4 84.0	J (all detects) J (all detects)	A

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-CJ-01-0'** and TSB-CJ-01-0'-FD**, samples TSB-CJ-01-0'** and TSB-CJ-01-0'-FDDL**, samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD, and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FDDL were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
beta-BHC	19	80	123 (≤50)	-	J (all detects)	A
4,4'-DDE	18	1.8U	-	16.2 (≤1.8)	J (all detects) UJ (all non-detects)	A
4,4'-DDT	1.8	2.5	-	0.7 (≤1.8)	-	-
2,4'-DDE	2.5	1.8U	-	0.7 (≤1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FDDL**				
beta-BHC	19	90	130 (≤50)	-	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
beta-BHC	3.0	65	-	62 (≤1.7)	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
4,4'-DDE	1.9	82	-	80.1 (≤1.7)	J (all detects)	A
Methoxychlor	7.8	3.0	-	4.8 (≤3.4)	J (all detects)	A
alpha-BHC	1.7U	5.7	-	4.0 (≤1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDT	1.7U	37	-	35.3 (≤1.7)	J (all detects) UJ (all non-detects)	A
2,4'-DDD	1.7U	1.8	-	0.1 (≤1.7)	-	-
2,4'-DDE	1.7U	30	-	28.3 (≤1.7)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FDDL				
beta-BHC	3.0	75	-	72 (≤17)	J (all detects)	A
4,4'-DDE	1.9	96	-	94.1 (≤17)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-01-0'** TSB-CJ-06-10'	All TCL compounds	J+ (all detects)	P	Surrogate recovery (%R)
TRNC-D-2	TSB-CJ-05-0' TSB-CJ-06-0'-FD	All TCL compounds	J+ (all detects)	A	Surrogate recovery (%R)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-01-0'-FD** TSB-CR-01-0'	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-05-0'	alpha-BHC beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-01-0'**	2,4'-DDE	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-01-0'-FDDL** TSB-CR-01-0'DL TSB-CJ-02-0'DL**	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-05-0' TSB-CJ-06-0'-FD	Methoxychlor 2,4'-DDD	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-05-0'DL	alpha-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	J (all detects) J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-06-0'-FDDL	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-01-0'** TSB-CJ-01-0'-FD** TSB-CJ-01-0'-FDDL**	beta-BHC	J (all detects)	A	Field duplicates (RPD)
TRNC-D-2	TSB-CJ-01-0'** TSB-CJ-01-0'-FD**	4,4'-DDE	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE Methoxychlor	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	alpha-BHC 4,4'-DDT 2,4'-DDE	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FDDL	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B3a
SDG #: TRNC-D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/21/08
Page: 1 of 1
Reviewer: JNG
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	A	Sampling dates: 11/12/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D_1 = 4, 6 D_2 = 4, 7 D_3 = 18, 19 D_4 = 18, 20
XV.	Field blanks	N	

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

1	TSB-CJ-02-0'**	11	TSB-CR-01-0'DL	21	TSB-CJ-06-10'	31	7319099 MB
2	TSB-CJ-02-0'DL**	12	TSB-CR-01-10'	22	TSB-CR-01-0'MS	32	
3	TSB-CJ-02-10'**	13	TSB-CR-03-0'	23	TSB-CR-01-0'MSD	33	
4	TSB-CJ-01-0'** D_1 D_2	14	TSB-CR-03-10'	24		34	
5	TSB-CJ-01-10'**	15	TSB-CJ-05-0'	25		35	
6	TSB-CJ-01-0'-FD** D_1	16	TSB-CJ-05-0'DL	26		36	
7	TSB-CJ-01-0'-FDDL** D_1	17	TSB-CJ-05-10'	27		37	
8	TSB-CR-02-0'**	18	TSB-CJ-06-0' D_3 D_4	28		38	
9	TSB-CR-02-10'	19	TSB-CJ-06-0'-FD D_3	29		39	
10	TSB-CR-01-0'	20	TSB-CJ-06-0'-FDDL D_4	30		40	

LDC #: 18180 B3a
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVZ
2nd Reviewer: LF

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

Validation Area	Yes	No	NA	Findings/Comments
I. 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?	✓			
IV. 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) $\leq$ 15%.0 or percent recovieries 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?	✓			
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 #: 18100 pma
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JVC
2nd Reviewer: ✓

Validation Area	Yes	No	NA	Findings/Comments
VII. 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.	✓			
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.	✓			
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.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'- DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'- DDD	NN.

Notes:_____

LDC #: 18100B3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

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

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

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?
Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		2,7,11,16,20 (10X)	STX-CLP1	A	DO (73-116)	No qual
				B	↓ (57-144)	↓
					( )	
		4		B	197 ( )	J+ dets / P
					( )	
		15		B	581 ( )	J+ dets / A
					( )	↓
		19		B	455 ( )	
					( )	
		21	↓	A	154 ( )	J+ dets / P
			↓	B	155 ( )	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 B3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

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

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?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		22/23	B	0 (62-109)	0 (62-109)	( )	10	No qual (LCS in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100 B3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

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

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

Level IV/D Only

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> Cal range	1, 6, 10	J dets /A
	A, B, J, O, EE		15	
	B, J		19	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 B3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JV6
2nd Reviewer: [illegible]

METHOD: GC HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	EE	4	69.8	J dets A
	B	7	46.2	
	B	11	46.3	
	P	15	169.4	
	FF	↓	99.6	
	A	16	47.7	
	~~B~~		—	
	J		93.0	
	O		87.9	
	~~EE~~	↓	60.4	
	B	2	47.0	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100B2a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 2 of 2
Reviewer: JVC
2nd Reviewer: L

METHOD: ✓ GC ___ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	P	19	65.8	J dets /A
	FF	↓	51.6	↓
	B	20	42.4	
	~~EE~~ J	↓	84.0	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100B3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 2
Reviewer: JVG
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (≤50) (Parent only)
	4	6	
B	19	80	123 (≤50 RPD) J dets/A
J	18	1.8 U	16.2 ≤1.8 Diff J/UJ/A
O	1.8	2.5	0.7
EE	2.5	1.8 U	0.7

Compound	Concentration (ug/kg)		RPD (Parent only)
	4	7	
B	19	90	130 (≤50% RPD) J dets/A
J	18	NR	NC
O	1.8		
EE	2.5		

Compound	Concentration (ug/kg)		RPD (Parent only)
	18	19	
B	3.0	65	62 (≤1.7 Diff) J dets/A
J	1.9	82	80.1
P	7.8	3.0	4.8 (≤3.4 Diff)
A	1.7 U	5.7	4.0 ≤1.7 Diff J/UJ/A
O		37	35.3
FF		1.8	0.1

Compound	Concentration ( )		RPD
EE		30	28.3 J/UJ/A

LDC #: 18100 B3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (Parent only)
	18	20	
B	3.0	75	72 (≤ 17 Diff) J dets/A
J	1.9	96	94.1 ↓ ↓
P	7.8	NR	NC

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18100 D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC ✓ HPLC _____

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

#	Standard ID	Calibration Date	Compound	Reported CF (0.100 std)	Recalculated CF (0.100 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/21/07	H (STX-CLP1)	474162270	474162270	506321046	506321046	4.443	4.443
			P ↓	188364990	188364990	19462854	19462854	4.147	4.147
			H CLP2)	263177950	263177795	283388787	283388787	4.470	4.470
2			P ↓ ↓	55406290	55406290	55632434	55632434	3.297	3.297
3									
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.

LDC #: 18100 D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: [signature]

METHOD: GC ✓ HPLC ____

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

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	KCAL 117	11/23/07	H (CSTX-CLP1)	0.0250	0.0256	0.0256	2.6	2.6
			P 1		0.0248	0.0248	0.7	0.7
			H Y		0.0257	0.0257	0.8	0.8
2			P Y		0.0248	0.0248	0.9	0.8
3	KCAL215	11/26/07	B STX-CLP1)	0.0250	0.0246	0.0246	1.7	1.7
			Y		0.0250	0.0250	0	0
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.

LDC #: 18100 D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

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

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	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	STX-CLP1	0.0200	0.01618	81	81	0
Decachlorobiphenyl	↓	↓	0.01833	92	92	↓
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						

Sample ID:

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

Notes:

LDC #: 18160 D3v
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: L

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 = | MS - MSD | * 2/(MS + MSD)

MS = Matrix spike percent recovery; MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 22/23

Compound	Spike Added (ng/kg)		Sample Concentration (ng/kg)	Spiked Sample Concentration (ng/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC	17.0	16.7	0	15.6	15.9	92	92	95	95	1.9	1.9
4,4'-DDT	↓	↓	↓	18.1	18.3	107	106	110	110	1.1	1.1

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% of the recalculated results.

LDC #: 18100D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [signature]

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 = | LCS - LCSD | * 2/(LCS + LCSD)

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

LCS/LCSD samples: 7319099 LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	16.7	N.A	13.5	NA	81	81				
4,4'-DDT	↓	↓	15.3	↓	91	91				

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 #: 18100B34
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVC
2nd reviewer:

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

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

Example: Col. B

Sample I.D. #2 b-BHC

Conc. = $\frac{(2671079)\ (10\ mL)\ (1000)(D)}{(28216425)\ (30.20g)\ (0.946)}$ 18842816

= 49.6 ug/kg

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

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 5, 2008

Matrix: Soil/Water

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'
TSB-DR-06-10'
TSB-DR-05-0'
TSB-DR-05-0'DL
TSB-DR-05-0'-FD
TSB-DR-05-10'
TSB-DR-03-0'
TSB-DR-03-10'
TSB-DJ-01-0'
TSB-DJ-01-10'
TSB-DR-04-0'
TSB-DR-04-0'DL
TSB-DR-04-10'
TSB-CR-04-0'
TSB-CR-04-0'DL
TSB-CR-04-10'
TSB-CR-05-0'
TSB-CR-05-10'
TSB-CR-06-0'
TSB-CR-06-10'
RINSATE-2
TSB-DR-03-0'MS
TSB-DR-03-0'MSD
RINSATE-2MS
RINSATE-2MSD

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 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.

Raw data were not reviewed for this SDG. The review was 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/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.

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.

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

The individual 4,4'-DDT and Endrin breakdowns were not within QC limits. Since the samples were all non-detected, no data were qualified.

V. Blanks

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

Sample "RINSATE-2" 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-DR-04-0'	STX-CLP1	Decachlorobiphenyl	420 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CR-04-0'	STX-CLP1	Decachlorobiphenyl	162 (57-144)	All TCL compounds	J+ (all detects)	A

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 one compound, the 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. 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

Raw data were not reviewed for this SDG.

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-DR-05-0' TSB-CR-04-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-DR-04-0'	beta-BHC 4,4'-DDE 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
TSB-DR-05-0'DL	beta-BHC	47.1	J (all detects)	A
TSB-DR-04-0'DL	beta-BHC 4,4'-DDE	44.7 87.7	J (all detects) J (all detects)	A
TSB-CR-04-0'DL	beta-BHC	44.3	J (all detects)	A

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD and samples TSB-DR-05-0'DL and TSB-DR-05-0'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
beta-BHC	41	1.7U	-	39.3 (≤1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDE	1.8	1.7U	-	0.1 (≤1.7)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'DL	TSB-DR-05-0'-FD				
beta-BHC	45	1.7U	-	43.3 (≤17)	J (all detects) UJ (all non-detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-04-0' TSB-CR-04-0'	All TCL compounds	J+ (all detects)	A	Surrogate recovery (%R)
TRNC-D-3	TSB-DR-05-0' TSB-CR-04-0'	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-3	TSB-DR-04-0'	beta-BHC 4,4'-DDE 2,4'-DDE	J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-3	TSB-DR-05-0'DL TSB-CR-04-0'DL	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-3	TSB-DR-04-0'DL	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-0'DL	beta-BHC	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

LDC #: 18100C3a
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: JV6
2nd Reviewer: [signature]

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	A	Sampling dates: 11/13/07
II.	GC/ECD Instrument Performance Check	SW	see CCV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7k130262-008 (TRNC-D-2)
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D_1 = 3, 5 D_2 = 4, 5
XV.	Field blanks	ND	R = 21

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: Soil + Water

1	TSB-DR-06-0' S	11	TSB-DR-04-0' S	21	RINSTATE-2 W	31	7319049 MB
2	TSB-DR-06-10'	12	TSB-DR-04-0'DL	22	TSB-DR-03-0'MS S	32	7320107 MB
3	TSB-DR-05-0' D_1	13	TSB-DR-04-10'	23	TSB-DR-03-0'MSD	33	7324447 MB
4	TSB-DR-05-0'DL D_2	14	TSB-CR-04-0'	24	RINSTATE-2MS W	34	
5	TSB-DR-05-0'-FD D_1 D_2	15	TSB-CR-04-0' DL	25	RINSTATE-2MSD	35	
6	TSB-DR-05-10'	16	TSB-CR-04-10'	26		36	
7	TSB-DR-03-0'	17	TSB-CR-05-0'	27		37	
8	TSB-DR-03-10'	18	TSB-CR-05-10'	28		38	
9	TSB-DJ-01-0'	19	TSB-CR-06-0'	29		39	
10	TSB-DJ-01-10'	20	TSB-CR-06-10'	30		40	

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDD	NN.

Notes: _____

LDC #: 18110C3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: 1

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

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

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

[✓ Y] N N/A Were Evaluation mix standards run before initial calibration and before samples?

Y [✓ N] N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

[✓ Y] N N/A Was at least one standard run daily to verify the working curve?

Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	11/26/07	KPEM214	STXCLP1	K	%Breakdown ≤ 15% 19.40	( )	21	No qual (ND)
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		

A. alpha-BHC
B. beta-BHC
C. delta-BHC
D. gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. DB 608
DD. DB 1701
EE. ________
FF. ________
GG. ________
HH. ________
II. ________
JJ. ________

CONCAL.3S

LDC #: 18100C3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: JV
2nd Reviewer: L

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

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

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?
Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		4 (10x)	SIX-CLP1	A	DO (73-116)	No qual
			↓	B	↓ (57-114)	↓
					( )	
		~~10~~ 11		B	420 ( )	J+ dets /A
					( )	
		12 (10x)		A	DO ( )	No qual
				B	↓ ( )	↓
					( )	
		14		B	162 ( )	J+ dets /A
					( )	
		15 (10x)		A	DO ( )	No qual
			↓	B	( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 C3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

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

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?
[✓ Y] ~~N~~ N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		F7K130262-008	B	0 (62-109)	0 (62-109)	( )	None	No qual
		(from TRNC-D-2)		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		22/23	B	197 (62-109)	213 (62-109)	( )	7	No qual (LCS in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 18160C39a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JV6
2nd Reviewer: [illegible]

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

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

Level IV/D Only

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> cal range	3, 14	J dets /A
	B, J, EE		11	

Comments: See sample calculation verification worksheet for recalculations

(#14 not marked E on the Form 1)

LDC #: 18100C3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: NG
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

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

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y (N) N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	B	4	47.1	J dets/A
				↓
	B	12	44.7	
	J	↓	87.7	↓
	~~B~~ B	15	44.3	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100C3a
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (Parent only)
	3	5	
B	41	1.7 U	39.3 (≤ 1.7 Diff) J/UJ/A
J	1.8	↓	0.1 (≤ ↓) -

Compound	Concentration (ug/kg)		RPD (Parent only)
	4	5	
B	45	1.7 U	43.3 (≤ 17 Diff) J/UJ/A

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 28, 2008

Matrix: Soil

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-0'DL
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-0'-FDDL
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-0'DL
JB-NW-DITCH01-10'

Introduction

This data review covers 19 soil 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.

Raw data were not reviewed for this SDG. The review was 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/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.

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
11/27/07	KCAL294	STX-CLP2	Endrin	16.8	JB-NW-DITCH01-10'	J+ (all detects)	A

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

The individual 4,4'-DDT and Endrin breakdowns were not within QC limits. Since the samples were all non-detected, no data were qualified.

V. Blanks

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

No field blanks were identified in this SDG.

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
TSB-DR-02-0'-FD	Decachlorobiphenyl	170 (57-144)	All TCL compounds	J+ (all detects)	P
JB-NW-DITCH01-0'	Decachlorobiphenyl	237 (57-144)	All TCL compounds	J+ (all detects)	A

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 not within QC limits. Since there were no associated samples, no data were qualified.

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

Raw data were not reviewed for this SDG.

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-FJ-07-0' TSB-FJ-06-0'-FD	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
JB-NW-DITCH01-0'	4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
TSB-FJ-06-0'	4,4'-DDE Endrin aldehyde	93.8 188.3	J (all detects) J (all detects)	A
TSB-FJ-06-10'	4,4'-DDT	69.2	J (all detects)	A
JB-NW-DITCH01-0'	alpha-BHC	46.2	J (all detects)	A
TSB-FJ-06-0'-FDDL	beta-BHC	49.9	J (all detects)	A

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD, samples TSB-FJ-06-0' and TSB-FJ-06-0'-FDDL, and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
beta-BHC	120	46	89 (≤50)	-	J (all detects)	A
4,4'-DDE	66	1.7U	-	64.3 ug/Kg (≤18)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Endrin aldehyde	20	1.7U	-	18.3 ug/Kg (≤18)	J (all detects) UJ (all non-detects)	A
alpha-BHC	18U	2.1	-	15.9 ug/Kg (≤18)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FDDL				
beta-BHC	120	52	-	68 ug/Kg (≤18)	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
beta-BHC	1.7U	28	-	26.3 ug/Kg (≤1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDE	1.7U	31	-	29.3 ug/Kg (≤1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDT	1.7U	19	-	17.3 ug/Kg (≤1.7)	J (all detects) UJ (all non-detects)	A
2,4'-DDE	1.7U	8.8	-	7.1 ug/Kg (≤1.7)	J (all detects) UJ (all non-detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	JB-NW-DITCH01-10'	Endrin	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-4	TSB-DR-02-0'-FD	All TCL compounds	J+ (all detects)	P	Surrogate recovery (%R)
TRNC-D-4	JB-NW-DITCH01-0'	All TCL compounds	J+ (all detects)	A	Surrogate recovery (%R)
TRNC-D-4	TSB-FJ-07-0' TSB-FJ-06-0'-FD	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-4	JB-NW-DITCH01-0'	4,4'-DDE	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-4	TSB-FJ-06-0'	4,4'-DDE Endrin aldehyde	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	TSB-FJ-06-10'	4,4'-DDT	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	JB-NW-DITCH01-0'	alpha-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	TSB-FJ-06-0'-FDDL	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	beta-BHC	J (all detects)	A	Field duplicates (RPD)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	4,4'-DDE Endrin aldehyde	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FDDL	beta-BHC	J (all detects)	A	Field duplicates (Difference)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D3a
SDG #: TRNC-D-4
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: SVG
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	A	Sampling dates: 11/14/07
II.	GC/ECD Instrument Performance Check	SW	See CCV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7K140171-006 (TRNC-D-3)
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D_1 = 6,7 D_2 = 6,8 D_3 = 14,16
XV.	Field blanks	N	

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: Soil

+ 1 !	TSB-FR-01-0'	− 11 ✓	TSB-FJ-05-10'	− 21 !	7320107 MB	31	
− 2 !	TSB-FR-01-10'	+ 12 ✓	TSB-DR-01-0'	− 22 ✓	7324198 MB	32	
+ 3 !	TSB-FJ-07-0'	− 13 ✓	TSB-DR-01-10'	23		33	
+ 4 !	TSB-FJ-07-0'DL	− 14 ✓	TSB-DR-02-0' D_3	24		34	
− 5 !	TSB-FJ-07-10'	− 15 ✓	TSB-DR-02-10'	25		35	
+ 6 !	TSB-FJ-06-0' D_1 D_2	+ 16 ✓	TSB-DR-02-0'-FD D_3	26		36	
+ 7 !	TSB-FJ-06-0'-FD D_1	+ 17 ✓	JB-NW-DITCH01-0'	27		37	
+ 8 !	TSB-FJ-06-0'-FDDL D_2	+ 18 ✓	JB-NW-DITCH01-0'DL	28		38	
+ 9 !	TSB-FJ-06-10'	+ 19 ✓	JB-NW-DITCH01-10'	29		39	
+ 10 ✓	TSB-FJ-05-0'	20		30		40	

10%

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDD	NN.

Notes: _____

LDC #: 18180 D3a
SDG #: See Cover

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

Y N N/A Were Evaluation mix standards run before initial calibration and before samples?

[✓ Y] N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

[✓ Y] N N/A Was at least one standard run daily to verify the working curve?

Y [✓ N] N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	11/27/07	KCAL 294	STX-CLP 2	K (+)	16.8	( )	19	J + dets / A
		(CCV)				( )		
						( )		
					% breakdown ≤ 15 %	( )		
	11/28/07	KPEM 342	STX-CLP 2	K	17.85	( )	3	No qual (ND)
		(PEM)				( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC
B. beta-BHC
C. delta-BHC
D. gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. DB 608
DD. DB 1701
EE. ________
FF. ________
GG. ________
HH. ________
II. ________
JJ. ________

CONCAL.3S

LDC #: 18100 D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

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

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

Y (N) N/A Were surrogates spiked into all samples, standards and blanks?
Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		4 (10x)	SIX-CLP 1	A	DO (73-116)	No qual
		6		B	(57-144)	
		8			( )	
		18			( )	
					( )	
		16		B	170 ( )	J+ dets / A
					( )	
		17		B	237 ( )	J+ dets / A
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

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

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?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		F7K140171-006	B	197 (62-109)	213 (62-109)	( )	None	No qual
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100 D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: 1

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

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

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> cal range	3, 7	J dets/A
		↓		↓
	J	↓	17	↓

Comments: See sample calculation verification worksheet for recalculations

COMQUANewPest.wpd

LDC #: 18100 D36
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JVL
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

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

Level IV/D Only

(Y) N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y (N) N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	J	6	93.8	J det /A
	R	↓	188.3	
	O	9	69.2	
	A	17	46.2	
	B	8	49.9	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100D3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JV
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (Parent only)
	6	7	
B	120	46	89 (≤50% RPD) J det/A
J	66	1.7 U	64.3 (≤1.8 Diff) J/UJ/A
R	20	↓	18.3 ↓ ↓
A	18 U	2.1	15.9 ↓ -

Compound	Concentration (ug/kg)		RPD
	6	8	
B	~~B~~ 120	52	~~79~~ 68 (≤1.8 Diff) J det/A
J	66	NR	NC
R	20	↓	↓

Compound	Concentration (ug/kg)		RPD
	14	16	
B	1.7 U	28	26.3 (≤1.7 Diff) J/UJ/A
J	↓	31	29.3 ↓ ↓
O		19	17.3
EE	↓	8.8	7.1 ↓ ↓

Compound	Concentration ( )		RPD

LDC Report# 18100E3a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FR-02-10'RE**
TSB-FJ-09-0'**
TSB-FJ-09-0'RE**
TSB-FJ-09-10'**
TSB-FJ-09-10'RE**
TSB-FR-03-0'**
TSB-FR-03-0'RE**
TSB-FR-03-0'REDL**
TSB-FR-03-10'**
TSB-FR-03-10'RE**
RINSATE-3
TSB-FJ-09-10'REMS
TSB-FJ-09-10'REMSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 24 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 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.

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-FR-02-10'RE** TSB-FJ-09-0'RE** TSB-FR-03-0'RE** TSB-FR-03-0'REDL** TSB-FR-03-10'RE**	All TCL compounds	20	14	J- (all detects) UJ (all non-detects)	A
TSB-FJ-09-10'RE** TSB-FJ-09-10'REMS TSB-FJ-09-10'REMSD	All TCL compounds	26	14	J- (all detects) UJ (all non-detects)	A

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
11/27/07	KCAL294	STX-CLP2	Endrin	16.8	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	J+ (all detects)	A
11/28/07	KCAL308	STX-CLP2	Endrin	18.7	TSB-FJ-02-10'**	J+ (all detects)	A
12/12/07	KCAL073	STX-CLP1	4,4'-DDD	24.1	TSB-FJ-09-10'RE** TSB-FJ-09-10'REMS TSB-FJ-09-10'REMSD 7345204MB	J+ (all detects)	A

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.

The individual 4,4'-DDT and Endrin breakdowns were not within QC limits. Since the samples were all non-detected, no data were qualified.

V. Blanks

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

Sample "RINSATE-3" 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. Surrogate recoveries (%R) were not within QC limits for samples TSB-FR-02-0'** and TSB-FR-03-0'REDL**. Since these samples were diluted out, no data were qualified.

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 not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recoveries (%R) were not within QC limits for all TCL compounds, the MS/MSD percent recoveries (%R) 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-FR-03-0'RE**	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
TSB-FR-02-0'**	4,4'-DDE 4,4'-DDT	58.1 50.5	J (all detects) J (all detects)	A
TSB-FR-03-0'**	2,4'-DDE	55.5	J (all detects)	A

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
4,4'-DDE	1.8U	1.9	-	0.1 ug/Kg (≤1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
beta-BHC	1.8U	22	-	20.2 ug/Kg (≤1.8)	J (all detects) UJ (all non-detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FR-02-10'RE** TSB-FJ-09-0'RE** TSB-FR-03-0'RE** TSB-FR-03-0'REDL** TSB-FR-03-10'RE** TSB-FJ-09-10'RE**	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'**	Endrin	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-09-10'RE**	4,4'-DDD	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FR-03-0'RE**	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-5	TSB-FR-02-0'**	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-5	TSB-FR-03-0'**	2,4'-DDE	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	beta-BHC	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E3a
SDG #: TRNC/D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/24/08
Page: 1 of 1
Reviewer: JR
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: 11/15/07
II.	GC/ECD Instrument Performance Check	SW	See CCV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	FFK140171-021 (TRNC/D-3) FFK140148-008 (TRNC/D-6) ~~FFK140148-001 (TRNC/D-6)~~
VIII.	Laboratory control samples	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D_1 = 1, 2 D_2 = 8, 9
XV.	Field blanks	ND	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

Soil + Water

1	TSB-FJ-03-0'**	D_1 S	11	TSB-FR-02-0'**	S	21	TSB-FR-03-10'**	S	31	73 24198	MB
2	TSB-FJ-03-0'-FD**	D_1	12	TSB-FR-02-10'**		22	TSB-FR-03-10'RE**		32	7325371	MB
3	TSB-FJ-03-10'**		13	TSB-FR-02-10'RE**		23	RINSATE-3	W	33	7331072	MB
4	TSB-FJ-10-0'**		14	TSB-FJ-09-0'**		24	TSB-FJ-09-10'MS	S	34	7345204	MD
5	TSB-FJ-10-10'**		15	TSB-FJ-09-0'RE**		25	TSB-FJ-09-10'MSD		35	7324457	MB
6	TSB-FJ-04-0'**		16	TSB-FJ-09-10'**		26			36		
7	TSB-FJ-04-10'**		17	TSB-FJ-09-10'RE**		27			37		
8	TSB-FJ-02-0'**	D_2	18	TSB-FR-03-0'**		28			38		
9	TSB-FJ-02-0'-FD**	D_2	19	TSB-FR-03-0'~~RE~~RE**		29			39		
10	TSB-FJ-02-10'**		20	TSB-FR-03-0'REDL**		30			40		

11/20 11/28 12/05 12/11 11/20

LDC #: 18100 F34
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

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

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	NA	✓		
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?	✓			
IV. 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) $\leq$ 15%.0 or percent recovieries 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?	✓			
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 #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JW
2nd Reviewer: V

Validation Area	Yes	No	NA	Findings/Comments
VII. 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.	✓			
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.	✓			
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.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 18100 E36
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: SVG
2nd Reviewer: 1

All circled dates have exceeded the technical holding times.
Y/N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
13, 15, 19, 20,	S	N	11/15/07	12/05/07	12/07/07	20	J-/UJ/A
22	↓	↓	↓				↓
17, 24, 25	↓	↓	↓	12/11/07	12/12/07	26	↓

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVB
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ___ %D or ___ RPD

Y (N) N/A Were Evaluation mix standards run before initial calibration and before samples?
Y (N) N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
(Y) N N/A Was at least one standard run daily to verify the working curve?
Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
					% BD ≤15 %	( )		
	11/26/07	KPEM 214	STX-CLP2	K	19.40	( )	23	No qual (ND)
						( )		
	11/28/07	KPEM 313		K	15.89	( )	16	
						( )		
	11/28/07	KPEM 342		K	17.85	( )	11	
						( )		
						( )		
						( )		
	11/27/07	KCAL 294	STX-CLP2	K (+)	16.8	( )	1-9	J+ dets /A
		(CCV)				( )		
						( )		
						( )		
	11/28/07	KCAL 308	STX-CLP2	K (+)	18.7	( )	10	
		(CCV)				( )		
						( )		
						( )		
	12/13/07	KCAL073	STX-CLP1	M (+)	24.1	( )	17, 24, 25, 734520 + MB	
		(CCV)				( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC	E. Heptachlor	I. Dieldrin	M. 4,4'-DDD	Q. Endrin ketone	U. Toxaphene	Y. Aroclor-1242	CC. DB 608	GG.	
B. beta-BHC	F. Aldrin	J. 4,4'-DDE	N. Endosulfan sulfate	R. Endrin aldehyde	V. Aroclor-1016	Z. Aroclor-1248	DD. DB 1701	HH.	
C. delta-BHC	G. Heptachlor epoxide	K. Endrin	O. 4,4'-DDT	S. alpha-Chlordane	W. Aroclor-1221	AA. Aroclor-1254	EE.	II.	
D. gamma-BHC	H. Endosulfan I	L. Endosulfan II	P. Methoxychlor	T. gamma-Chlordane	X. Aroclor-1232	BB. Aroclor-1260	FF.	JJ.	

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

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

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

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?

Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		11 (10x)	~~RTX~~ STX-CLP	A	DO (73-116)	No qual
		20 (10x)	↓	B	↓ (57-~~144~~)	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

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

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?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		F7K190148-001	E	( )	175 (63-146)	58 (30)	None	No qual
			B	( )	114 (62-109)	( )	↓	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100 E 3a
SDG #: See Cover
METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

Please 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? ____________

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

[✓ Y] N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7325371 LCS	All TCL	< control limits	( )	( )	12,14,16,18,21,	No qual
				( )	( )	( )	7325371 MB	(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JTG
2nd Reviewer:

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

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

Level IV/D Only

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> cal range	19	J dets/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

(Y) N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
(Y) N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y (N) N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	J	11	58.1	J dets /A
	O	↓	50.5	
	EE	18	55.5	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVB
2nd reviewer: V

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A Were field duplicate pairs identified in this SDG?
X N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (Parent only)
	1	7	
J	1.8 U	1.9	0.1 (≤1.8 Diff) –

Compound	Concentration (ug/kg)		RPD (Parent only)
	8	9	
B	1.8 U	22	20.2 (≤1.8 Diff) J/UJ/A

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 2 of 2
Reviewer: SVG
2nd Reviewer: [signature]

METHOD: GC ✓ HPLC _____

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

#	Standard ID	Calibration Date	Compound	Reported CF (0.1 std)	Recalculated CF (0.1 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/21/07	H STX-CUP 1	47416270	47416 2270	506321046	506321046	4.443	4.443
			P 1	188364990	188364990	1946289541	1946289541	4.142	4.142
	GCK		H 2	263177950	263177950	283388782	283388782	4.470	4.470
2			P 2	55406290	55406290	563243234	563243234	3.292	3.292
3	ICAL	12/04/07	H 1	497776900	497776900	529584384	529584384	3.682	3.682
	GCK		P 1	214458330	214458330	246999058	246999058	8.028	8.028
			H 2	278077740 ~~263177950~~	278077740	~~306992176~~	306992176	5.576	5.576
4			P 2	59458080 ~~55406290~~	59458080	7020885	7020885	9.443	9.443

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 #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 2 of 2
Reviewer: JVG
2nd Reviewer: [signature]

METHOD: GC ✓ HPLC_____

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

#	Standard ID	Calibration Date	Compound	Reported CF (0.1 std)	Recalculated CF (0.1 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	12/03/07	H STX-CLP 1	224298420	224298420	244321004	244321004	6.586	6.586
			P 1	87244750	87249750	96310314	96310314	9.260	9.260
	GCP		H 2	288180890	288180890	300100006	300100006	5.614	5.614
2			P 2	66263200	66263200	69777808	69777808	7.816	7.816
3									
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.

LDC #: 18170 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JV6
2nd Reviewer: 1

METHOD: GC 8 HPLC _____

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

#	Standard ID	Calibration Date	Compound		Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	KCAL 280	11/27/08	H	GX-CLP 1	0.0250	0.0255	0.0255	2.2	2.2
			P	1		0.0276	0.0276	10.3	10.3
	(MB1)		H	2		0.0260	0.0260	4.2	4.2
2			P	2		0.0277	0.0277	10.8	10.8
3	KCA 294	11/27/08	H	1		0.0254	0.0254	1.5	1.5
			P	1		0.0274	0.0274	9.4	9.4
	(1-9)		H	2		0.0260	0.0260	4.0	4.0
4			P	✓ 2	✓	0.0269	0.0269	7.7	7.7

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 #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JV
2nd Reviewer: [signature]

METHOD: GC ✓ HPLC _____

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

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

#	Standard ID	Calibration Date	Compound		Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	KCAL 308	11/28/07	H	STX-CUP 1	0.0250	0.0263	0.0263	5.1	5.1
	(10)		P	1		0.0286	0.0286	14.3	14.3
			H	2		0.0270	0.0270	8.1	8.1
2			P	2		0.0280	0.0280	12.1	12.1
	↓								
3	KCAL 343	11/28/07	H	1		0.0260	0.0260	3.9	3.9
	(11)		P	1		0.0235	0.0235	5.9	5.9
			H	2		0.0254	0.0254	1.6	1.6
4			P	↓	✓	0.0230	0.0230	7.9	7.9

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 #: 18100 E34
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVL
2nd Reviewer: [signature]

METHOD: GC ✓ HPLC _____

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

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

#	Standard ID	Calibration Date	Compound		Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	KCAL 814	12/07/07	H	(8TX-CLP1)	0.0250	0.0257	0.0257	3.0	3.0
			P	1		0.0240	0.0240	4.0	4.0
	(15, 19, 22)		H	✓		0.0259	0.0259	3.8	3.8
2			P	✓		0.0238	0.0238	4.8	4.8
3	KCAL 800	12/07/07	H	1		0.0268	0.0268	7.3	7.3
	(13) (ND)		P	1		0.0264	0.0264	5.8	5.6
	(MB3)		H	✓		NR			
4			P	✓		↓			

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 #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVB
2nd Reviewer:

METHOD: GC ✓ HPLC _____

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

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

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	KCAL 073	12/11/07	H (STX-CUP1)	0.0250	0.0281	0.0281	12.4	12.4
			P 1		0.0241	0.0241	3.4	3.4
	(17, 21, 25) MB4 (ND)		H Y		NR			
2			P Y					
3	KCAL 078	12/10/07	B (STX-CUP1)		0.0259	0.0259	~~0.9~~ 3.5	3.5
			↓ ↓ Y		0.0258	0.0257	0.9	0.9
	(20)							
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.

(MB4 analyzed after ICAL)

LDC #: 18 100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

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

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: #1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	STX-CLP1	0.0200	0.01950	98	98	0
Decachlorobiphenyl	↓	↓	0.02071	104	104	↓
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						

Sample ID:

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

Notes:

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JV
2nd Reviewer: L

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: 24/25

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC	17.9	18.0	0	17.1	17.4	96	96	97	97	1.6	1.7
4,4'-DDT											

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% of the recalculated results.

LDC #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: L

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

LCS/LCSD samples: 7324198 LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	16.7	NA	14.2	NA	85	85				
4,4'-DDT	↓	↓	16.7	↓	100	100				

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 #: 18100 E3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SVL
2nd reviewer: V

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

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Example:

Sample I.D. # 2 4,4'-DDE

Conc. = $\frac{(259\,0806)(10\ ml)(1000)}{(5764\,93914)(30.3g)(0.941)}$

= 1.855

≈ 1.9 ug/kg

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

Note: _____

LDC Report# 18100F3a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-0'RE
TSB-FJ-08-10'
TSB-FJ-08-10'RE
TSB-FR-05-0'
TSB-FR-05-0'RE
TSB-FR-05-10'
TSB-FR-05-10'RE
TSB-FR-04-0'
TSB-FR-04-0'RE
TSB-FR-04-0'-FD
TSB-FR-04-0'FDRE
TSB-FR-04-10'
TSB-FR-04-10'RE
TSB-FJ-01-0'
TSB-FJ-01-0'RE
TSB-FJ-01-10'
TSB-FJ-01-10'RE
TSB-GR-01-0'
TSB-GR-01-0'RE
TSB-GR-01-5'
TSB-GR-01-5'RE
TSB-GR-01-5'REDL
TSB-GJ-06-0'
TSB-GJ-06-0'RE
TSB-GJ-06-5'
TSB-GJ-06-5'RE
TSB-GJ-01-0'
TSB-GJ-01-0'RE
TSB-GJ-01-5'
TSB-GJ-01-5'RE
RINSATE-4
TSB-FJ-08-0'REMS
TSB-FJ-08-0'REMSD
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD

Introduction

This data review covers 35 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 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.

Raw data were not reviewed for this SDG. The review was 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 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-FJ-08-0'RE TSB-FJ-08-10'RE TSB-FR-05-0'RE TSB-FR-05-10'RE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GR-01-5'REDL TSB-GJ-06-0'RE TSB-GJ-06-5'RE TSB-GJ-01-0'RE TSB-GJ-01-5'RE TSB-FR-04-0'RE TSB-FR-04-0'FDRE TSB-FJ-08-0'REMS TSB-FJ-08-0'REMSD	All TCL compounds	19	14	J- (all detects) UJ (all non-detects)	A

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.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GJ-06-5'	All TCL compounds	Performance Evaluation Mixtures were not analyzed at the proper frequency. The PEM was analyzed at 15:37 on 12/3/07 and the sample analysis was started at 05:19 on 12/4/07.	Performance Evaluation Mixtures must be analyzed for each column at the proper frequency within 12 hours of each sample analysis.	None	P

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
12/4/07	PCAL077	STX-CLP1	4,4'-DDE	21.4	TSB-FR-04-0'	J+ (all detects)	P
			Dieldrin	16.9	TSB-FR-04-0'-FD	J+ (all detects)	
			Endrin	17.8		J+ (all detects)	
			4,4'-DDD	26.5		J+ (all detects)	
			Endosulfan II	21.6		J+ (all detects)	
			4,4'-DDT	23.7		J+ (all detects)	
			Endrin aldehyde	22.2		J+ (all detects)	
			Methoxychlor	27.8		J+ (all detects)	
			Endosulfan sulfate	24.8		J+ (all detects)	
			Endrin ketone	22.8		J+ (all detects)	

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

The individual 4,4'-DDT and Endrin breakdowns were not within QC limits. Since the samples were all non-detected, no data were qualified.

V. Blanks

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

Sample "RINSATE-4" 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. Surrogate recoveries (%R) were not within QC limits for samples TSB-FR-04-0' and TSB-FR-04-0'-FD. Since these samples were diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MSD percent recoveries (%R) were not within QC limits for 2 compounds, the MS 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 recoveries (%R) were not within QC limits for all TCL compounds, the MS/MSD percent recoveries (%R) 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

Raw data were not reviewed for this SDG.

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-GR-01-5'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)	A

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD and samples TSB-FR-04-0'RE and TSB-FR-04-0'FDRE were identified as field duplicates. No chlorinated pesticides were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0'RE TSB-FJ-08-10'RE TSB-FR-05-0'RE TSB-FR-05-10'RE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GR-01-5'REDL TSB-GJ-06-0'RE TSB-GJ-06-5'RE TSB-GJ-01-0'RE TSB-GJ-01-5'RE TSB-FR-04-0'RE TSB-FR-04-0'FDRE	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Methoxychlor Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)
TRNC-D-6	TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GJ-06-5'	All TCL compounds	None	P	Continuing calibration (PEM)
TRNC-D-6	TSB-GR-01-5'RE	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation and CRQLs

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F3a
SDG #: TRNC/D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/23/08
Page: 1 of 1
Reviewer: JV6
2nd Reviewer: V

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: 11/16/07
II.	GC/ECD Instrument Performance Check	SW	See CCV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7K140171-021 (TRNC/D-3)
VIII.	Laboratory control samples	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D_1 = 9, 11 D_2 = 10, 12
XV.	Field blanks	ND	R = 32

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: Soil + Water

1	TSB-FJ-08-0'	S	11	TSB-FR-07-0'-FD	D_1	S	21	TSB-GR-01-5'	S	31	TSB-GJ-01-5'RE	S
2	TSB-FJ-08-0'DLRE		12	TSB-FR-07-0'-FD RE	D_2		22	TSB-GR-01-5'RE		32	RINSATE-4	W
3	TSB-FJ-08-10'		13	TSB-FR-04-10'			23	TSB-GR-01-5'REDL		33	TSB-FJ-08-0'MS RE	S
4	TSB-FJ-08-10'RE		14	TSB-FR-04-10'RE			24	TSB-GJ-06-0'		34	TSB-FJ-08-0'MSD RE	
5	TSB-FR-05-0'		15	TSB-FJ-01-0'			25	TSB-GJ-06-0'RE		35	TSB-FJ-01-0'MS	
6	TSB-FR-05-0'RE		16	TSB-FJ-01-0'RE			26	TSB-GJ-06-5'		36	TSB-FJ-01-0'MSD	
7	TSB-FR-05-10'		17	TSB-FJ-01-10'			27	TSB-GJ-06-5'RE		37	7325371 MB	prep 11/21
8	TSB-FR-05-10'RE		18	TSB-FJ-01-10'RE			28	TSB-GJ-01-0'		38	7339072 MB	11/05
9	TSB-FR-04-0'	D_1	19	TSB-GR-01-0'			29	TSB-GJ-01-0'RE		39	7324442 MB	
10	TSB-FR-04-0' RE	D_2	20	TSB-GR-01-0'RE			30	TSB-GJ-01-5'		40		

LDC #: 18100F3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: V

All circled dates have exceeded the technical holding times.
Y/N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All RE's	S	N	11/16/07	12/05/07	12/07-11/07	19	J-/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100 F34
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

(Y) N N/A Were Evaluation mix standards run before initial calibration and before samples?
Y (N) N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
(Y) N N/A Was at least one standard run daily to verify the working curve?
Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
		Samples were analyzed after the	12 hour (clock)			13, 15, 17, 26	None /P	
		for PEM had expired	( )					
		(PPEM028 analyzed 12/03/07 at 15:37	( )					
		sample analysis started at 12/04/07 at 5:19)	( )					
			( )					
			( )					
	12/04/07	PCAL077	STX-CLP1	J (+)	21.4	( )	9, 11	J + dets/P
		(CCV)		I	16.9	( )		
				K	17.8	( )		
				M	26.5	( )		
				L	21.6	( )		
				O	23.7	( )		
				R	22.2	( )		
				P	27.8	( )		
				N	24.8	( )		
				Q	22.8	( )		
					(2 BD ≤15%)	( )		
	11/26/07	KPEM214	STX-CLP2	K	19.40	( )	32	No qual (ND)
						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC	E. Heptachlor	I. Dieldrin	M. 4,4'-DDD	Q. Endrin ketone	U. Toxaphene	Y. Aroclor-1242	CC. DB 608	GG.
B. beta-BHC	F. Aldrin	J. 4,4'-DDE	N. Endosulfan sulfate	R. Endrin aldehyde	V. Aroclor-1016	Z. Aroclor-1248	DD. DB 1701	HH.
C. delta-BHC	G. Heptachlor epoxide	K. Endrin	O. 4,4'-DDT	S. alpha-Chlordane	W. Aroclor-1221	AA. Aroclor-1254	EE.	II.
D. gamma-BHC	H. Endosulfan I	L. Endosulfan II	P. Methoxychlor	T. gamma-Chlordane	X. Aroclor-1232	BB. Aroclor-1260	FF.	JJ.

LDC #: 18100T39a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: SR
2nd Reviewer:

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

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

Y (N) N/A Were surrogates spiked into all samples, standards and blanks?

Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		9 (50x)	Not specified	A	DO (73-116)	No qual
				B	(57-144)	
					( )	
		11 (50x)		A	( )	
			↓	B	( )	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 F3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

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

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?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		35/36	E	( )	175 (63-146)	58 (30)	2	No qual (MS in)
			B	( )	114 (62-109)	( )	↓	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100 F3a
SDG #: See Cover
METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

Please 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? ____________

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N [✓ N/A] Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7325371 LCS	All <	control (limits	( )	( )	1, 3, 5, 7, 9, 11, 13, 15,	No qual
				( )	( )	( )	17, 19, 21, 24, 26, 28,	(MS/MSD in)
				( )	( )	( )	30, 7325371 MB	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100 F3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JV
2nd Reviewer:

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

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

Level IV/D Only

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

#	Compound Name	Finding	Associated Samples	Qualifications
	J, O	> cal range	22	J detects / A

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 28, 2008

Matrix: Soil

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-0'-FDDL
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-0'DL
TSB-GJ-04-5'
TSB-GJ-04-5'RE
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
TSB-GJ-04-5'MS
TSB-GJ-04-5'MSD

Introduction

This data review covers 19 soil 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.

Raw data were not reviewed for this SDG. The review was 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 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-GJ-04-5'RE TSB-GJ-04-5'MS TSB-GJ-04-5'MSD	All TCL compounds	21	14	J- (all detects) UJ (all non-detects)	A

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.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	All TCL compounds	Performance Evaluation Mixtures were not analyzed at the proper frequency. The PEM was analyzed at 14:47 on 12/4/07 and the sample analysis was started at 04:22 on 12/5/07.	Performance Evaluation Mixtures must be analyzed for each column at the proper frequency within 12 hours of each sample analysis.	None	P

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
12/11/07	KCAL015	STX-CLPII	4,4'-DDD	15.9	TSB-GJ-04-5'RE TSB-GJ-04-5'MS TSB-GJ-04-5'MSD	J+ (all detects)	A

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

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

V. Blanks

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

No field blanks were identified in this SDG.

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-GJ-04-5'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	40 (73-116) 44 (57-144)	All TCL compounds	J- (all detects) UJ (all non-detects)	A
7330197MB	Not specified	Tetrachloro-m-xylene	61 (73-116)	All TCL compounds	J- (all detects) UJ (all non-detects)	P

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. Although the LCS percent recovery (%R) was not within QC limits for one compound, the MS/MSD percent recoveries (%R) 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

Raw data were not reviewed for this SDG.

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-GR-02-0'-FD	4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-GJ-04-0'	4,4'-DDE 4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD, samples TSB-GR-02-0' and TSB-GR-02-0'-FDDL, and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
beta-BHC	5.1	18	-	12.9 (≤1.8)	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
4,4'-DDE	2.3	25	-	22.7 (≤1.8)	J (all detects)	A
4,4'-DDT	3.4	64	-	60.6 (≤1.8)	J (all detects)	A
2,4'-DDE	1.7U	1.8	-	0.1 (≤1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FDDL				
4,4'-DDT	3.4	69	-	65.6 (≤1.7)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GJ-04-5'RE	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-7	TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	All TCL compounds	None	P	Continuing calibration (PEM frequency)
TRNC-D-7	TSB-GJ-04-5'RE	4,4'-DDD	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GJ-04-5'	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Surrogate spikes (%R)
TRNC-D-7	TSB-GR-02-0'-FD	4,4'-DDT	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-7	TSB-GJ-04-0'	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	beta-BHC 4,4'-DDE 4,4'-DDT	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-7	TSB-GR-02-0'-FDDL	4,4'-DDT	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G3a
SDG #: TRNC/D-7
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/23/08
Page: 1 of 1
Reviewer: SW
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: 11/19/07
II.	GC/ECD Instrument Performance Check	SW	See CCV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	SW	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D_1 = 1, 2 D_2 = 1, 3 D_3 = 9, 10
XV.	Field blanks	N	

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: Soil

1	TSB-GR-02-0'	D_1, D_2	11	TSB-GJ-02-5'		21	7330197 MB	31	
2	TSB-GR-02-0'-FD	D_1	12	TSB-GJ-07-0'		22	7344227 MB	32	
3	TSB-GR-02-0'-FDDL	D_2	13	TSB-GJ-07-5'		23		33	
4	TSB-GR-02-5'		14	TSB-GJ-05-0'		24		34	
5	TSB-GJ-04-0'		15	TSB-GJ-05-5'		25		35	
6	TSB-GJ-04-0'DL		16	TSB-GJ-03-0'	@	26		36	
7	TSB-GJ-04-5'		17	TSB-GJ-03-5'		27		37	
8	TSB-GJ-04-5'RE		18	TSB-GJ-04-5'MS		28		38	
9	TSB-GJ-02-0'	D_3	19	TSB-GJ-04-5'MSD		29		39	
10	TSB-GJ-02-0'-FD	D_3	20			30		40	

@ 10X
100X

LDC #: 18100G34
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: JVC
2nd Reviewer: [signature]

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
8,18,19	S	N	11/19/07	12/10/07	12/12/07	21	J-/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100 G3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ✓ %D or ___ RPD

Y (N) N/A Were Evaluation mix standards run before initial calibration and before samples?
(Y) N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
Y (N) N/A Was at least one standard run daily to verify the working curve?
Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
		Samples were analyzed after the 12 hr clock ( )					9-17	None /p
		for PEM had expired ( )						
		CKPEM622 analyzed at 12/04/07 14:47, Sample analysis started at 12/05/07 at 4:22)						
						( )		
						( )		
						( )		
	12/11/07	KCAL015	STX-CLPII	M (+)	15.9	( )	8, 18, 19, 7344227 MB	Jdets/A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC	E. Heptachlor	I. Dieldrin	M. 4,4'-DDD	Q. Endrin ketone	U. Toxaphene	Y. Aroclor-1242	CC. DB 608	GG.___
B. beta-BHC	F. Aldrin	J. 4,4'-DDE	N. Endosulfan sulfate	R. Endrin aldehyde	V. Aroclor-1016	Z. Aroclor-1248	DD. DB 1701	HH.___
C. delta-BHC	G. Heptachlor epoxide	K. Endrin	O. 4,4'-DDT	S. alpha-Chlordane	W. Aroclor-1221	AA. Aroclor-1254	EE.___	II.___
D. gamma-BHC	H. Endosulfan I	L. Endosulfan II	P. Methoxychlor	T. gamma-Chlordane	X. Aroclor-1232	BB. Aroclor-1260	FF.___	JJ.___

LDC #: 18100G3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: JVC
2nd Reviewer:

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

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

Y (N) N/A Were surrogates spiked into all samples, standards and blanks?
Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		3 (10x)	Not specified	A	DO (73-116)	No qual
		5 (10x)		B	↓ (57-114)	↓
		6 (100x)			( )	
		16 (80x)			( )	
					( )	
					( )	
		7		A	40 ( )	J-/UJ/A
				B	44 ( )	↓
					( )	
		7330197 MB		A	61 ( )	J-/UJ/P
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100G3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please 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? ____________
Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7344227 LCS	E	150 (74-128)	( )	( )	8, 7344227MB	No qual
				( )	( )	( )		(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100G3a
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JVC
2nd Reviewer: [signature]

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

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

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	0	> cal range	2	J dets /A
		↓		↓
	J, 0	↓	5	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 G2 39
SDG #: Soil Cores

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD	Parent only
	1	2		
B	5.1	18	12.9 (≤ 1.8 Diff)	J dets/A
J	2.3	25	22.7	
O	3.4	64	60.6	+
EE	1.7 U	1.8	0.1	—

Compound	Concentration (ug/kg)		RPD	Parent only
	1	3		
O	3.4	69	65.6 ≤ 1.7 Diff	J dets/A

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

PCBs

LDC Report# 18100E3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Polychlorinated Biphenyls

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-10-0'**
TSB-FJ-04-0'
TSB-FJ-02-0'
TSB-FJ-02-0'-FD
TSB-FR-02-0'
TSB-FJ-09-0'
TSB-FR-03-0'
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD
RINSATE-3MS
RINSATE-3MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 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.

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-3 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 with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FR-02-0'	Not specified	Decachlorobiphenyl	189 (51-145)	All TCL compounds	J+ (all detects)	P

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 (%R) were not within QC limits for some compounds, the LCS 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. 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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0' and TSB-FJ-02-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Aroclor-1248	35U	74	-	39 (≤35)	J (all detects) UJ (all non-detects)	A

BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FR-02-0'	All TCL compounds	J+ (all detects)	P	Surrogate spikes (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD**	Aroclor-1248	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E3b
SDG #: TRNC-D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/24/08
Page: 1 of 1
Reviewer: NV6
2nd Reviewer: N

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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	A	Sampling dates: 11/15/07
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	A	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	$D_1 = 1, 7$ * $D_7 = 5, 6$
XV.	Field blanks	ND	R = 10

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 + Water

1	TSB-FJ-03-0'**	D_1 S	11	TSB-FR-02-0'MS	S	21	7324735 MB	11/20	31
2	TSB-FJ-03-0'-FD**	D_1	12	TSB-FR-02-0'MSD	↓	22	7324347 MB	11/20	32
3	TSB-FJ-10-0'**		13	RINSATE-3MS	W	23			33
4	TSB-FJ-04-0'		14	RINSATE-3MSD	↓	24			34
5	TSB-FJ-02-0'	D_7	15			25			35
6	TSB-FJ-02-0'-FD	D_7	16			26			36
7	TSB-FR-02-0'		17			27			37
8	TSB-FJ-09-0'		18			28			38
9	TSB-FR-03-0'	↓	19			29			39
10	RINSATE-3	W	20			30			40

LDC #: 18108 E3b
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: VV
2nd Reviewer:

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

Validation Area	Yes	No	NA	Findings/Comments
I. 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?	✓			
IV. 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) $\leq$ 15%.0 or percent recovieries 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?	✓			
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 #: 18107 E3b
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [signature]

Validation Area	Yes	No	NA	Findings/Comments
VII. 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.	✓			
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.	✓			
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.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

LDC #: 18100 E3b
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JV
2nd Reviewer:

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

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

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?
Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		7		B	189 (51-145)	J+ det./ P
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
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					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 E 3b
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

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

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?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A 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	Qualifications
		11/12	V	161 (50-140)	150 (50-140)	( )	7	No qual (LCS in)
			BB	271 (59-134)	240 (59-134)	( )	↓	↓ ↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC #: 18100 E36
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in thie field duplicate pairs?

Compound	Concentration (ug/kg)		RPD (parent only)
	1	✓	
Arolor 1248	35 U	74	39 (≤ 35 Diff) J/UJ/A

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18100 E3b
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC ✓ HPLC _____

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

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/06 07	1260-1 (Cup 1)	11471	11471	11502	11502	9.589	9.589
			2	10743	10743	11104	11104	8.794	8.803
2									
3									
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.

LDC #: 18100 E36
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVZ
2nd Reviewer:

METHOD: GC_____HPLC_____

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

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	MCAL 859	11/20/07	1260 (CLP1)	1000	993.2276	993.2142	7	7
			↓ ✓	↓	1022.9631	1022.8	2.3	2.3
2	MCAL 870	11/20/07	(CLP1)	↓	996.1075	996.0898	0.4	0.4
			↓ ✓	✓	1043.8429	1043.7755	4.4	4.4
3								
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.

LDC #: 18100 E3b
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

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

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: # 1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl	CLP 1	20	23.1752	116	116	0
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						

Sample ID:

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

Notes:

LDC #: 18100F36
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: [illegible]

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: 11/12

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC											
4,4'-DDT											
1260	166	169	0	450	406	271	271	240	240	10	10

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% of the recalculated results.

LDC #: 18150 E26
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: JVB
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 = | LCS - LCSD | * 2/(LCS + LCSD)

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

LCS/LCSD samples: 7324735 LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC										
4,4'-DDT										
1260	167	NA	187	NA	112	112				

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 #: 18107 E3b
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

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

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

Example:

Sample I.D. #7 1248-1

$$\text{Conc.} = \frac{(430984)(10\text{ ml})}{(5760)(30.4\text{ g})}$$

$$= 25.97$$

$$1248\ \text{Total} = \frac{25.97 + 76.77 + 77.98 + 98.24}{4}$$

$$= 69.74$$

$$\text{final conc.} = \frac{69.74\ (2)}{(2)(0.941)}$$

$$= 74\ \text{ug/kg}$$

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

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Polychlorinated Biphenyls

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FR-05-0'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FJ-01-0'
RINSATE-4

Introduction

This data review covers 5 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 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.

Raw data were not reviewed for this SDG. The review was 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.

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.

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

V. Blanks

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

Sample RINSATE-4 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

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples.

LDC #: 18100F3b
SDG #: TRNC/D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/23/08
Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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	A	Sampling dates: 11/16/07
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	FFK160235-020 (TRNC/D-5)
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D = 3, 4
XV.	Field blanks	ND	R = 6

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:

Soil + Water

1 TSB-FJ-08-0' S		11	7324735 MB	21		31	
2 TSB-FR-05-0'		12	7324347 MB	22		32	
3 TSB-FR-04-0'		13		23		33	
4 TSB-FR-04-0'-FD		14		24		34	
5 TSB-FJ-01-0'		15		25		35	
6 RINSATE-4 W		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

Metals

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 17, 2008

Matrix: Soil/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 13 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 a 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.

Raw data were not reviewed for this SDG. The review was 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

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
11/20/07	CCV (2341)	Niobium	111.1 (85-115)	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' RINSATE 1 TSB-CR-07-0'MS TSB-CR-07-0'MSD RINSATE 1MS RINSATE 1MSD PB	J+ (all detects)	P

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)	Tin	0.43 ug/L	All water samples in SDG TRNC-D-1
ICB/CCB	Niobium Tungsten Lithium	5.8 ug/L 0.47 ug/L 13.7 ug/L	All water samples in SDG TRNC-D-1

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Arsenic Barium Boron Chromium Iron Niobium Phosphorus Potassium Sodium Thallium Titanium Tungsten Zinc	0.12 mg/Kg 0.069 mg/Kg 5.4 mg/Kg 0.42 mg/Kg 2.5 mg/Kg 2.3 mg/Kg 2.7 mg/Kg 1.6 mg/Kg 5.2 mg/Kg 0.23 mg/Kg 0.12 mg/Kg 0.29 mg/Kg 0.87 mg/Kg	All soil samples in SDG TRNC-D-1
ICB/CCB	Niobium Titanium Tungsten Vanadium Mercury	5.8 ug/L 0.3 ug/L 0.7 ug/L 0.8 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-1

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	Niobium Tin Tungsten	11.2 ug/L 0.62 ug/L 1.4 ug/L	25.0U ug/L 2.0U ug/L 5.0U ug/L
TSB-CR-07-0'	Boron Niobium Thallium Tungsten	7.9 mg/Kg 3.1 mg/Kg 0.36 mg/Kg 0.95 mg/Kg	20.1U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-07-10'	Boron Niobium Thallium Tungsten Mercury	7.6 mg/Kg 1.8 mg/Kg 0.28 mg/Kg 0.52 mg/Kg 7.5 ug/Kg	22.0U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg
TSB-CJ-08-0'	Boron Thallium Tungsten	6.0 mg/Kg 0.17 mg/Kg 0.34 mg/Kg	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-CJ-08-0'-FD	Boron Tungsten Mercury	5.6 mg/Kg 0.26 mg/Kg 10.6 ug/Kg	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-CJ-08-10'	Boron Tungsten	7.2 mg/Kg 0.32 mg/Kg	21.8U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-04-0'	Boron Tungsten Mercury	6.4 mg/Kg 0.31 mg/Kg 7.7 ug/Kg	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg
TSB-CJ-04-10'	Boron Tungsten	7.8 mg/Kg 0.33 mg/Kg	21.7U mg/Kg 1.1U mg/Kg
TSB-CJ-07-10'	Boron Tungsten Mercury	6.7 mg/Kg 0.29 mg/Kg 9.1 ug/Kg	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-CJ-07-10'	Boron Tungsten	7.3 mg/Kg 0.31 mg/Kg	22.5U mg/Kg 1.1U mg/Kg
TSB-CJ-03-0'	Boron Tungsten Mercury	6.9 mg/Kg 0.26 mg/Kg 10.9 ug/Kg	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg
TSB-CJ-03-10'	Boron Tungsten	6.3 mg/Kg 0.29 mg/Kg	21.5U mg/Kg 1.1U 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	11/9/07	Boron Cadmium Calcium Magnesium Molybdenum Niobium Sodium Strontium Thallium Tin Titanium Tungsten	14.9 ug/L 0.045 ug/L 70.0 ug/L 5.4 ug/L 0.27 ug/L 11.2 ug/L 65.1 ug/L 0.42 ug/L 0.72 ug/L 0.62 ug/L 0.47 ug/L 1.4 ug/L	All soil samples in SDG TRNC-D-1

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-CR-07-0'	Boron Molybdenum Niobium Thallium Tin Tungsten	7.9 mg/Kg 0.86 mg/Kg 3.1 mg/Kg 0.36 mg/Kg 0.32 mg/Kg 0.95 mg/Kg	20.1U mg/Kg 1.0U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-07-10'	Boron Cadmium Molybdenum Niobium Thallium Tin Tungsten	7.6 mg/Kg 0.060 mg/Kg 0.53 mg/Kg 1.8 mg/Kg 0.28 mg/Kg 0.34 mg/Kg 0.52 mg/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-CJ-08-0'	Boron Cadmium Molybdenum Thallium Tin Tungsten	6.0 mg/Kg 0.097 mg/Kg 0.55 mg/Kg 0.17 mg/Kg 0.19 mg/Kg 0.34 mg/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-CJ-08-0'-FD	Boron Cadmium Molybdenum Tin Tungsten	5.6 mg/Kg 0.062 mg/Kg 0.53 mg/Kg 0.24 mg/Kg 0.26 mg/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-CJ-08-10'	Boron Cadmium Molybdenum Tin Tungsten	7.2 mg/Kg 0.054 mg/Kg 0.58 mg/Kg 0.25 mg/Kg 0.32 mg/Kg	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-CJ-04-0'	Boron Cadmium Molybdenum Tin Tungsten	6.4 mg/Kg 0.081 mg/Kg 0.48 mg/Kg 0.21 mg/Kg 0.31 mg/Kg	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-CJ-04-10'	Boron Cadmium Molybdenum Tin Tungsten	7.8 mg/Kg 0.11 mg/Kg 0.77 mg/Kg 0.29 mg/Kg 0.33 mg/Kg	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	6.7 mg/Kg 0.086 mg/Kg 0.60 mg/Kg 0.16 mg/Kg 0.29 mg/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	7.3 mg/Kg 0.088 mg/Kg 0.64 mg/Kg 0.22 mg/Kg 0.31 mg/Kg	22.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.45U mg/Kg 1.1U mg/Kg
TSB-CJ-03-0'	Boron Cadmium Molybdenum Tin Tungsten	6.9 mg/Kg 0.086 mg/Kg 0.55 mg/Kg 0.20 mg/Kg 0.26 mg/Kg	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-CJ-03-10'	Boron Molybdenum Tin Tungsten	6.3 mg/Kg 0.57 mg/Kg 0.30 mg/Kg 0.29 mg/Kg	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U 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-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Antimony Tungsten Zinc	56.3 (75-125) 74.8 (75-125) -	59.3 (75-125) - 56.9 (75-125)	- - - -	J- (all detects) UJ (all non-detects)	A
TSB-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Niobium	198.2 (75-125)	212.7 (75-125)	-	J+ (all detects)	A
TSB-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Phosphorus	63.0 (75-125)	29.1 (75-125)	-	J- (all detects) R (all non-detects)	A

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.

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not performed in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-CR-07-0'L	Magnesium Phosphorus Potassium Vanadium	10.9 (≤10) 16.8 (≤10) 10.8 (≤10) 13.6 (≤10)	All soil samples in SDG TRNC-D-1	J (all detects) J (all detects) J (all detects) J (all detects)	A

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Aluminum	7100	5530	25 (≤50)	-	-	-
Antimony	0.16	0.11U	-	0.05 (≤1.0)	-	-
Arsenic	2.5	3.1	-	0.6 (≤2.1)	-	-
Barium	172	124	32 (≤50)	-	-	-
Beryllium	0.40	0.34	-	0.06 (≤2.1)	-	-
Boron	6.0	5.6	-	0.4 (≤20.9)	-	-
Cadmium	0.097	0.062	-	0.035(≤0.10)	-	-
Calcium	17900	28200	45 (≤50)	-	-	-
Chromium	7.3	5.4	-	1.9 (≤2.1)	-	-
Cobalt	6.2	3.6	53 (≤50)	-	J (all detects)	A
Copper	14.6	11.1	27 (≤50)	-	-	-
Iron	11700	8060	37 (≤50)	-	-	-
Lead	10.6	4.9	74 (≤50)	-	J (all detects)	A
Magnesium	7840	5760	31 (≤50)	-	-	-
Manganese	400	163	84 (≤50)	-	J (all detects)	A
Molybdenum	0.55	0.53	-	0.02 (≤1.0)	-	-
Nickel	13.7	8.4	48 (≤50)	-	-	-
Palladium	0.36	0.46	-	0.1 (≤0.21)	-	-
Phosphorus	1230	869	34 (≤50)	-	-	-
Potassium	2870	2270	23 (≤50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Silicon	159	220	32 (≤50)	-	-	-
Silver	0.095	0.087	-	0.008 (≤0.42)	-	-
Sodium	549	496	10 (≤50)	-	-	-
Strontium	162	197	19 (≤50)	-	-	-
Thallium	0.17	0.15U	-	0.02 (≤0.42)	-	-
Tin	0.19	0.24	-	0.05 (≤0.42)	-	-
Titanium	450	398	12 (≤50)	-	-	-
Tungsten	0.34	0.26	-	0.08 (≤1.0)	-	-
Uranium	0.73	0.86	-	0.13 (≤0.21)	-	-
Vanadium	28.7	22.5	24 (≤50)	-	-	-
Zinc	28.2	19.4	37 (≤50)	-	-	-
Zirconium	19.8	19.4	-	0.4 (≤4.2)	-	-
Lithium	10.2	12.9	-	2.7 (≤10.4)	-	-
Sulfur	550	946	-	396 (≤1040)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Mercury	7.0U	10.6	-	3.6 (≤34.8)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' RINSATE 1	Niobium	J+ (all detects)	P	Calibration (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Antimony Tungsten Zinc	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Niobium	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Phosphorus	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Magnesium Phosphorus Potassium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	Cobalt Lead Manganese	J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	RINSATE 1	Niobium Tin Tungsten	25.0U ug/L 2.0U ug/L 5.0U ug/L	A
TRNC-D-1	TSB-CR-07-0'	Boron Niobium Thallium Tungsten	20.1U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CR-07-10'	Boron Niobium Thallium Tungsten Mercury	22.0U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg	A
TRNC-D-1	TSB-CJ-08-0'	Boron Thallium Tungsten	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CJ-08-0'-FD	Boron Tungsten Mercury	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-1	TSB-CJ-08-10'	Boron Tungsten	21.8U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-04-0'	Boron Tungsten Mercury	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	TSB-CJ-04-10'	Boron Tungsten	21.7U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Tungsten Mercury	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Tungsten	22.5U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-03-0'	Boron Tungsten Mercury	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg	A
TRNC-D-1	TSB-CJ-03-10'	Boron Tungsten	21.5U mg/Kg 1.1U mg/Kg	A

BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	TSB-CR-07-0'	Boron Molybdenum Niobium Thallium Tin Tungsten	20.1U mg/Kg 1.0U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CR-07-10'	Boron Cadmium Molybdenum Niobium Thallium Tin Tungsten	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-08-0'	Boron Cadmium Molybdenum Thallium Tin Tungsten	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CJ-08-0'-FD	Boron Cadmium Molybdenum Tin Tungsten	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	TSB-CJ-08-10'	Boron Cadmium Molybdenum Tin Tungsten	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-04-0'	Boron Cadmium Molybdenum Tin Tungsten	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-04-10'	Boron Cadmium Molybdenum Tin Tungsten	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	22.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.45U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-03-0'	Boron Cadmium Molybdenum Tin Tungsten	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-03-10'	Boron Molybdenum Tin Tungsten	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

LDC #: 18100A4
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/15/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: [illegible]

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

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	A	Sampling dates: 11/09/07
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not performed
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(3,4)
XIV.	Field Blanks	SW	R=12

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: All soil except #12, 15, 16 A2

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21		31	
2	TSB-CR-07-10'	12	RINSATE 1 A2	22		32	
3	TSB-CJ-08-0'	13	TSB-CR-07-0'MS	23		33	
4	TSB-CJ-08-0'-FD	14	TSB-CR-07-0'MSD	24		34	
5	TSB-CJ-08-10'	15	RINSATE 1MS A2	25		35	
6	TSB-CJ-04-0'	16	RINSATE 1MSD ↓	26		36	
7	TSB-CJ-04-10'	17	PB	27		37	
8	TSB-CJ-07-0'	18		28		38	
9	TSB-CJ-07-10'	19		29		39	
10	TSB-CJ-03-0'	20		30		40	

Notes: _____

DC #: 18100A4
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-12	Soil/Aq	[✓ 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,
13,14	Soil	[✓ 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,]
15,16	Aq	[✓ 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, 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,
1-12	Soil/Aq	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,]
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
13,14	Soil	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,]
15,16	Aq	[✓ 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,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
Analysis Method		
ICP		[✓ Li, S,]
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,]
GFAA		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, CN⁻

Comments: [✓ Mercury by CVAA if performed]
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18100A4
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

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

Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N N/A Was a midrange cyanide standard distilled?

Y N N/A Are all correlation coefficients ≥0.995?

Y N N/A 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
1	11/20/07	CCV(2341)	Nb	111.1	A11 A12 +1-7, 13, 14, +PB	J+ Lt /P

Comments:

CAL.4SW

LDC #: 18100A4
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:
Associated Samples: All AQ

Reviewer:
2nd Reviewer:

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	12									
Nb			5.8		11.2 / 25.0									
Sn		0.43			0.62 / 2.0									
W			0.47		1.4 / 5.0									
Li			13.7											

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 #: 18100A4
SDG #: TRNC-D-1
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All Soil

				Sample Identification										
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10	11
As	0.12													
Ba	0.069													
B	5.4			7.9 / 20.1	7.6 / 22.0	6.0 / 20.9	5.6 / 20.9	7.2 / 21.8	6.4 / 21.1	7.8 / 21.7	6.7 / 20.9	7.3 / 22.5	6.9 / 21.1	6.3 / 21.5
Cr	0.42													
Fe	2.5													
Nb	2.3	5.8		3.1 / 5.0	1.8 / 5.5									
P	2.7													
K	1.6													
Na	5.2													
Tl	0.23		2.3	0.36 / 0.40	0.28 / 0.44	0.17 / 0.42								
Ti	0.12	0.3												
W	0.29	0.7		0.95 / 1.0	0.52 / 1.1	0.34 / 1.0	0.26 / 1.0	0.32 / 1.1	0.31 / 1.1	0.33 / 1.1	0.29 / 1.0	0.31 / 1.1	0.26 / 1.1	0.29 / 1.1
V		0.8												
Zn	0.87													
Hg (ug/Kg)		0.1			7.5 / 36.7		10.6 / 34.8		7.7 / 35.2		9.1 / 34.8		10.9 / 35.2	

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 #: 18100A4
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /09 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification											
	12	Action Level	1	2	3	4	5	6	7	8	9	10	11
B	14.9		7.9 / 20.1	7.6 / 22.0	6.0 / 20.9	5.6 / 20.9	7.2 / 21.8	6.4 / 21.1	7.8 / 21.7	6.7 / 20.9	7.3 / 22.5	6.9 / 21.1	6.3 / 21.5
Cd	0.045			0.060 / 0.11	0.097 / 0.10	0.062 / 0.10	0.054 / 0.11	0.081 / 0.11	0.11 / 0.11	0.086 / 0.10	0.088 / 0.11	0.086 / 0.11	
Ca	70.0												
Mg	5.4												
Mo	0.27		0.86 / 1.0	0.53 / 1.1	0.55 / 1.0	0.53 / 1.0	0.58 / 1.1	0.48 / 1.1	0.77 / 1.1	0.60 / 1.0	0.64 / 1.1	0.55 / 1.1	0.57 / 1.1
Nb	11.2		3.1 / 5.0	1.8 / 5.5									
Na	65.1	130.2											
Sr	0.42												
Tl	0.72		0.36 / 0.40	0.28 / 0.44	0.17 / 0.42								
Sn	0.62		0.32 / 0.40	0.34 / 0.44	0.19 / 0.42	0.24 / 0.42	0.25 / 0.44	0.21 / 0.42	0.29 / 0.43	0.16 / 0.42	0.22 / 0.45	0.20 / 0.42	0.30 / 0.43
Ti	0.47												
W	1.4		0.95 / 1.0	0.52 / 1.1	0.34 / 1.0	0.26 / 1.0	0.32 / 1.1	0.31 / 1.1	0.33 / 1.1	0.29 / 1.0	0.31 / 1.1	0.26 / 1.1	0.29 / 1.1

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".

LDC #: 18100A4
SDG #: TKNC-01

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MM
2nd Reviewer: [illegible]

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 a matrix spike analyzed for each matrix in this SDG?

Y N N/A 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.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	15/16	Aq	Fe			29.1 (≤20)	All Aq	No qual (LCS, MS/MSD in)
2	13/14	Soil	Sb	56.3	59.3		All Soil	J-/UJ/A
			Nb	198.2	212.7			J+/UJ/A
			P	63.0	29.1			J-/R/A
			W	74.8				J-/UJ/A
			Zn		56.9			↓
			Si			25.6 (≤20)	↓	No qual (LCS in)

Comments:

LDC #: 18040

SDG #: JKNC-001

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

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

100x MDL for ICP/MS, 50x MDL for ICP

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

Y N N/A If analyte concentrations were > ~~50X~~ the IDL, was an ICP serial dilution analyzed?

Y N N/A Were ICP serial dilution percent differences (%D) ≤10%?

Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Soil	Mg	10.9	All Soil	J (+) / A
			P	16.8	↓	↓
			K	10.8		
			V	13.6		

Comments: Ca < 100xMDL ✓

SDIL4S2

LDC#: 18100A4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 3	Concentration (mg/kg) 4	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	7100	5530	25			
Antimony	0.16	0.11U		0.05	(≤1.0)	
Arsenic	2.5	3.1		0.6	(≤2.1)	
Barium	172	124	32			
Beryllium	0.40	0.34		0.06	(≤0.21)	
Boron	6.0	5.6		0.4	(≤20.9)	
Cadmium	0.097	0.062		0.035	(≤0.10)	
Calcium	17900	28200	45			
Chromium	7.3	5.4		1.9	(≤2.1)	
Cobalt	6.2	3.6	53			J det / A
Copper	14.6	11.1	27			
Iron	11700	8060	37			
Lead	10.6	4.9	74			J det / A
Magnesium	7840	5760	31			
Manganese	400	163	84			J det / A
Molybdenum	0.55	0.53		0.02	(≤1.0)	
Nickel	13.7	8.4	48			
Palladium	0.36	0.46		0.1	(≤0.21)	
Phosphorus	1230	869	34			

LDC#: 18100A4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 3	Concentration (mg/kg) 4	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Potassium	2870	2270	23			
Silicon	159	220	32			
Silver	0.095	0.087		0.008	(≤0.42)	
Sodium	549	496	10			
Strontium	162	197	19			
Thallium	0.17	0.15U		0.02	(≤0.42)	
Tin	0.19	0.24		0.05	(≤0.42)	
Titanium	450	398	12			
Tungsten	0.34	0.26		0.08	(≤1.0)	
Uranium	0.73	0.86		0.13	(≤0.21)	
Vanadium	28.7	22.5	24			
Zinc	28.2	19.4	37			
Zirconium	19.8	19.4		0.4	(≤4.2)	
Lithium	10.2	12.9		2.7	(≤10.4)	
Sulfur	550	946		396	(≤1040)	
Mercury (ug/Kg)	7.0U	10.6		3.6	(≤34.8)	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 22, 2008

Matrix: Soil

Parameters: Metals

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil 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 a 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.

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.

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)	Calcium Chromium Copper Iron Nickel Phosphorus Potassium Sodium Tin Titanium Zinc Mercury	15.7 mg/Kg 0.27 mg/Kg 0.25 mg/Kg 3.2 mg/Kg 0.36 mg/Kg 1.6 mg/Kg 2.6 mg/Kg 5.1 mg/Kg 0.089 mg/Kg 0.13 mg/Kg 1.4 mg/Kg 7.8 ug/Kg	All samples in SDG TRNC-D-2
ICB/CCB	Niobium Tin Titanium Tungsten Vanadium Lithium	5.8 ug/L 0.2 ug/L 0.3 ug/L 0.7 ug/L 0.8 ug/L 12.5 ug/L	All samples in SDG TRNC-D-2

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
TSB-CJ-02-0'**	Niobium Tungsten	5.3 mg/Kg 0.53 mg/Kg	5.3U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-02-10'**	Niobium Tungsten Mercury	1.8 mg/Kg 0.31 mg/Kg 7.2 ug/Kg	5.2U mg/Kg 1.1U mg/Kg 34.9U ug/Kg
TSB-CJ-01-0'**	Tin Tungsten Mercury	0.39 mg/Kg 0.23 mg/Kg 32.7 ug/Kg	0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-CJ-01-10'**	Niobium Tungsten	1.9 mg/Kg 0.45 mg/Kg	5.3U mg/Kg 1.1U mg/Kg
TSB-CJ-01-0'-FD**	Tin Tungsten Mercury	0.39 mg/Kg 0.28 mg/Kg 9.9 ug/Kg	0.42U mg/Kg 1.0U mg/Kg 34.6U ug/Kg
TSB-CR-02-0'**	Tungsten Mercury	0.22 mg/Kg 17.8 ug/Kg	1.0U mg/Kg 34.3U ug/Kg
TSB-CR-02-10'	Tungsten	0.23 mg/Kg	1.1U mg/Kg
TSB-CR-01-0'	Tin Tungsten Lithium Mercury	0.41 mg/Kg 0.46 mg/Kg 10.0 mg/Kg 9.4 ug/Kg	0.41U mg/Kg 1.0U mg/Kg 10.2U mg/Kg 34.0U ug/Kg
TSB-CR-01-10'	Tungsten Mercury	0.58 mg/Kg 7.5 ug/Kg	1.0U mg/Kg 34.7U ug/Kg
TSB-CR-03-0'	Tungsten Mercury	0.28 mg/Kg 10.5 ug/Kg	1.0U mg/Kg 33.8U ug/Kg
TSB-CR-03-10'	Tungsten Mercury	0.35 mg/Kg 8.4 ug/Kg	1.1U mg/Kg 34.9U ug/Kg
TSB-CJ-05-0'	Tungsten Mercury	0.35 mg/Kg 7.8 ug/Kg	1.0U mg/Kg 34.6U ug/Kg
TSB-CJ-05-10'	Tungsten	0.32 mg/Kg	1.1U mg/Kg
TSB-CJ-06-0'	Tin Mercury	0.39 mg/Kg 9.8 ug/Kg	0.41U mg/Kg 33.9U ug/Kg
TSB-CJ-06-0'-FD	Tungsten Mercury	0.33 mg/Kg 14.5 ug/Kg	1.0U mg/Kg 34.1U ug/Kg
TSB-CJ-06-10'	Tin	0.43 mg/Kg	0.46U mg/Kg

No field blanks were identified in this SDG.

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-CR-01-0'MS/MSD (All samples in SDG TRNC-D-2)	Antimony	58.7 (75-125)	61.7 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-CR-01-0'MS/MSD (All samples in SDG TRNC-D-2)	Barium	176.4 (75-125)	148.7 (75-125)	-	J+ (all detects)	A
	Niobium	233.3 (75-125)	254.4 (75-125)	-	J+ (all detects)	
	Silicon	395.4 (75-125)	504.7 (75-125)	-	J+ (all detects)	
	Strontium	264.8 (75-125)	147.5 (75-125)	-	J+ (all detects)	
	Titanium	162.0 (75-125)	195.5 (75-125)	-	J+ (all detects)	

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.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which a EPA 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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-CR-01-0'L	Phosphorus	11.3 (≤10)	All samples in SDG TRNC-D-2	J (all detects)	A

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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
Aluminum	5770 mg/Kg	6440 mg/Kg	11 (≤50)	-	-	-
Antimony	0.11 mg/Kg	0.13 mg/Kg	-	0.02 mg/Kg (≤1.0)	-	-
Arsenic	2.8 mg/Kg	3.4 mg/Kg	-	0.6 mg/Kg (≤2.1)	-	-
Barium	123 mg/Kg	118 mg/Kg	4 (≤50)	-	-	-
Beryllium	0.37 mg/Kg	0.45 mg/Kg	-	0.08 mg/Kg (≤0.21)	-	-
Boron	7.5 mg/Kg	5.7 mg/Kg	-	1.8 mg/Kg (≤20.9)	-	-
Cadmium	0.075 mg/Kg	0.074 mg/Kg	-	0.001 mg/Kg (≤0.10)	-	-
Calcium	27700 mg/Kg	27400 mg/Kg	1 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
Chromium	5.6 mg/Kg	4.8 mg/Kg	-	0.8 mg/Kg (≤2.1)	-	-
Cobalt	3.9 mg/Kg	5.0 mg/Kg	25 (≤50)	-	-	-
Copper	10.4 mg/Kg	11.6 mg/Kg	11 (≤50)	-	-	-
Iron	7730 mg/Kg	8810 mg/Kg	13 (≤50)	-	-	-
Lead	6.0 mg/Kg	6.1 mg/Kg	2 (≤50)	-	-	-
Magnesium	5960 mg/Kg	6780 mg/Kg	13 (≤50)	-	-	-
Manganese	200 mg/Kg	242 mg/Kg	19 (≤50)	-	-	-
Molybdenum	0.46 mg/Kg	0.44 mg/Kg	-	0.02 mg/Kg (≤1.0)	-	-
Nickel	8.7 mg/Kg	10.6 mg/Kg	20 (≤50)	-	-	-
Palladium	0.44 mg/Kg	0.47 mg/Kg	-	0.03 mg/Kg (≤0.21)	-	-
Phosphorus	954 mg/Kg	1230 mg/Kg	25 (≤50)	-	-	-
Potassium	2660 mg/Kg	2690 mg/Kg	1 (≤50)	-	-	-
Silicon	268 mg/Kg	248 mg/Kg	8 (≤50)	-	-	-
Silver	0.090 mg/Kg	0.087 mg/Kg	-	0.003 mg/Kg (≤042)	-	-
Sodium	794 mg/Kg	444 mg/Kg	57 (≤50)	-	J (all detects)	A
Strontium	183 mg/Kg	202 mg/Kg	10 (≤50)	-	-	-
Tin	0.39 mg/Kg	0.39 mg/Kg	-	0 mg/Kg (≤0.42)	-	-
Titanium	372 mg/Kg	334 mg/Kg	11 (≤50)	-	-	-
Tungsten	0.23 mg/Kg	0.28 mg/Kg	-	0.05 mg/Kg (≤1.0)	-	-
Uranium	0.87 mg/Kg	0.93 mg/Kg	-	0.06 mg/Kg (≤0.21)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
Vanadium	20.8 mg/Kg	22.0 mg/Kg	6 (≤50)	-	-	-
Zinc	20.3 mg/Kg	20.9 mg/Kg	3 (≤50)	-	-	-
Zirconium	19.1 mg/Kg	19.5 mg/Kg	-	0.4 mg/Kg (≤20.9)	-	-
Lithium	10.9 mg/Kg	14.9 mg/Kg	-	4 mg/Kg (≤10.4)	-	-
Sulfur	1200 mg/Kg	421U mg/Kg	-	779 mg/Kg (≤1040)	-	-
Mercury	37.2 ug/Kg	9.9 ug/Kg	-	27.3 ug/Kg (≤34.8)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Aluminum	5770 mg/Kg	5930 mg/Kg	3 (≤50)	-	-	-
Antimony	0.14 mg/Kg	0.13 mg/Kg	-	0.01 mg/Kg (≤1.0)	-	-
Arsenic	4.5 mg/Kg	2.2 mg/Kg	-	2.3 mg/Kg (≤2.1)	J (all detects)	A
Barium	117 mg/Kg	163 mg/Kg	33 (≤50)	-	-	-
Beryllium	0.44 mg/Kg	0.38 mg/Kg	-	0.06 mg/Kg (≤4.1)	-	-
Boron	3.6 mg/Kg	3.2 mg/Kg	-	0.4 mg/Kg (≤20.5)	-	-
Cadmium	0.058 mg/Kg	0.094 mg/Kg	-	0.036 mg/Kg (≤0.10)	-	-
Calcium	22800 mg/Kg	16000 mg/Kg	35 (≤50)	-	-	-
Chromium	6.9 mg/Kg	7.1 mg/Kg	-	0.2 mg/Kg (≤0.21)	-	-
Cobalt	5.6 mg/Kg	5.6 mg/Kg	0 (≤50)	-	-	-
Copper	10.4 mg/Kg	12.7 mg/Kg	20 (≤50)	-	-	-
Iron	9170 mg/Kg	10900 mg/Kg	17 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Lead	6.5 mg/Kg	13.0 mg/Kg	67 (≤50)	-	J (all detects)	A
Magnesium	8300 mg/Kg	6740 mg/Kg	21 (≤50)	-	-	-
Manganese	231 mg/Kg	366 mg/Kg	45 (≤50)	-	-	-
Molybdenum	0.38 mg/Kg	0.53 mg/Kg	-	0.15 mg/Kg (≤1.0)	-	-
Nickel	11.1 mg/Kg	12.8 mg/Kg	14 (≤50)	-	-	-
Palladium	0.36 mg/Kg	0.30 mg/Kg	-	0.06 mg/Kg (≤0.21)	-	-
Phosphorus	712 mg/Kg	938 mg/Kg	27 (≤50)	-	-	-
Potassium	2110 mg/Kg	2200 mg/Kg	4 (≤50)		-	-
Silicon	219 mg/Kg	159 mg/Kg	32 (≤50)	-	-	-
Silver	0.10 mg/Kg	0.089 mg/Kg	-	0.011 mg/Kg (≤0.41)	-	-
Sodium	484 mg/Kg	253 mg/Kg	63 (≤50)	-	J (all detects)	A
Strontium	165 mg/Kg	142 mg/Kg	15 (≤50)	-	-	-
Tin	0.39 mg/Kg	0.48 mg/Kg	-	0.09 mg/Kg (≤0.41)	-	-
Titanium	368 mg/Kg	485 mg/Kg	27 mg/Kg	-	-	-
Tungsten	0.20U mg/Kg	0.33 mg/Kg	-	0.13 mg/Kg (≤1.0)	-	-
Uranium	0.84 mg/Kg	0.77 mg/Kg	-	0.07 mg/Kg (≤0.21)	-	-
Vanadium	23.3 mg/Kg	28.8 mg/Kg	21 mg/Kg	-	-	-
Zinc	21.4 mg/Kg	31.7 mg/Kg	39 (≤50)	-	-	-
Zirconium	18.2 mg/Kg	20.5 mg/Kg	-	2.3 mg/Kg (≤20.5)	-	-
Lithium	10.2 mg/Kg	11.4 mg/Kg	-	1.2 mg/Kg (≤10.2)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Mercury	9.8 ug/Kg	14.5 ug/Kg	-	4.7 ug/Kg (≤34.1)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Barium Niobium Silicon Strontium Titanium	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Phosphorus	J (all detects)	A	ICP serial dilution (%D)
TRNC-D-2	TSB-CJ-01-0'** TSB-CJ-01-0'-FD**	Sodium	J (all detects)	A	Field duplicates (RPD)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	Arsenic	J (all detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	Lead Sodium	J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-2	TSB-CJ-02-0'**	Niobium Tungsten	5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-2	TSB-CJ-02-10'**	Niobium Tungsten Mercury	5.2U mg/Kg 1.1U mg/Kg 34.9U ug/Kg	A
TRNC-D-2	TSB-CJ-01-0'**	Tin Tungsten Mercury	0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-2	TSB-CJ-01-10'**	Niobium Tungsten	5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-2	TSB-CJ-01-0'-FD**	Tin Tungsten Mercury	0.42U mg/Kg 1.0U mg/Kg 34.6U ug/Kg	A
TRNC-D-2	TSB-CR-02-0'**	Tungsten Mercury	1.0U mg/Kg 34.3U ug/Kg	A
TRNC-D-2	TSB-CR-02-10'	Tungsten	1.1U mg/Kg	A
TRNC-D-2	TSB-CR-01-0'	Tin Tungsten Lithium Mercury	0.41U mg/Kg 1.0U mg/Kg 10.2U mg/Kg 34.0U ug/Kg	A
TRNC-D-2	TSB-CR-01-10'	Tungsten Mercury	1.0U mg/Kg 34.7U ug/Kg	A
TRNC-D-2	TSB-CR-03-0'	Tungsten Mercury	1.0U mg/Kg 33.8U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-2	TSB-CR-03-10'	Tungsten Mercury	1.1U mg/Kg 34.9U ug/Kg	A
TRNC-D-2	TSB-CJ-05-0'	Tungsten Mercury	1.0U mg/Kg 34.6U ug/Kg	A
TRNC-D-2	TSB-CJ-05-10'	Tungsten	1.1U mg/Kg	A
TRNC-D-2	TSB-CJ-06-0'	Tin Mercury	0.41U mg/Kg 33.9U ug/Kg	A
TRNC-D-2	TSB-CJ-06-0'-FD	Tungsten Mercury	1.0U mg/Kg 34.1U ug/Kg	A
TRNC-D-2	TSB-CJ-06-10'	Tin	0.46U mg/Kg	A

BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B4
SDG #: TRNC-D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/15/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: [illegible]

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

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	A	Sampling dates: 11/12/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	} MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	A	Not reviewed for Level 3
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	~~(3,5)~~ (3,5) (14,15)
XIV.	Field Blanks	N	

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

1	TSB-CJ-02-0'**	11	TSB-CR-03-10'	21		31	
2	TSB-CJ-02-10'**	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0'**	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10'**	14	TSB-CJ-06-0'	24		34	
5	TSB-CJ-01-0'-FD**	15	TSB-CJ-06-0'-FD	25		35	
6	TSB-CR-02-0'**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19	MS	29		39	
10	TSB-CR-03-0'	20		30		40	

Notes: _____

LDC #: 18100B4
SDG #: TRNC-D-2

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MH
2nd Reviewer:

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

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. 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)	✓			
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. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
V. 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.		✓		
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.		✓		
VI. 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				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analysies have duplicate injections? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	

LDC #: 18100B4
SDG #: JRNC-D-V

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: JA

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			7100X/mm for wet (s)
Were all percent differences (%Ds) < 10%?		✓		
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
VIII. Internal Standards (EPA-SW-846 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?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 18100B4
SDG #: TRNC-D-2

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-16	Soil	[✓ 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, ___ ___
17,18	Soil	[✓ 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, 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, ___ ___
1-16	Soil	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,] ___ ___
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr, ___ ___
17,18	Soil	[✓ 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, ___ ___
		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, S,] ___ ___
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,] ___ ___
GFAA		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, CN⁻

Comments: [✓ Mercury by CVAA if performed]
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18100B4
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000) Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All Soil

				Sample Identification										
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10	11
Ca	15.7													
Cr	0.27													
Cu	0.25													
Fe	3.2													
Ni	0.36													
Nb		5.8		5.3 / 5.3	1.8 / 5.2		1.9 / 5.3							
P	1.6													
K	2.6													
Na	5.1													
Sn	0.089	0.2				0.39 / 0.42		0.39 / 0.42			0.41 / 0.41			
Ti	0.13	0.3												
W		0..7		0.53 / 1.1	0.31 / 1.1	0.23 / 1.0	0.45 / 1.1	0.28 / 1.0	0.22 / 1.0	0.23 / 1.1	0.46 / 1.0	0.58 / 1.0	0.28 / 1.0	0.35 / 1.1
V		0.8												
Zn	1.4													
Li		12.5									10.0 / 10.2			
Hg (ug/Kg)	7.8				7.2 / 34.9	32.7 / 34.8		9.9 / 34.6	17.8 / 34.3		9.4 / 34.0	7.5 / 34.7	10.5 / 33.8	8.4 / 34.9

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 #: 18100B4
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000) Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All Soil

				Sample Identification										
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	12	13	14	15	16						
Ca	15.7													
Cr	0.27													
Cu	0.25													
Fe	3.2													
Ni	0.36													
Nb		5.8												
P	1.6													
K	2.6													
Na	5.1													
Sn	0.089	0.2				0.39 / 0.41		0.43 / 0.46						
Ti	0.13	0.3												
W		0..7		0.35 / 1.0	0.32 / 1.1		0.33 / 1.0							
V		0.8												
Zn	1.4													
Li		12.5									~~10.0 / 10.2~~			
Hg (ug/Kg)	7.8			7.8 / 34.6		9.8 / 33.9	14.5 / 34.1							

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 #: 18100B4
SDG #: TRNC-P-2

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MM
2nd Reviewer: R

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 a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	17/18	Soil	Sb	58.7	61.7		All	J- /UJ/A
			Ba	176.4	148.7			J+ /J+/A
			Nb	233.3	254.4			
			Si	395.4	504.7			
			Sr	264.8	147.5	29.1 (≤20)		(No qual for RPD exceedance)
			Ti	162.0	195.5			

Comments:

LDC #: 18100134
SDG #: TRNC-02

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MM
2nd Reviewer: [illegible]

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 If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed? 7/10 X MDL for ICP/Hg

Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?

Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	8	Soil	P	11.3	All	J (+) / A

Comments:

LDC#: 18100B4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg)		(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	3	5				
Aluminum	5770	6440	11			
Antimony	0.11	0.13		0.02	(≤1.0)	
Arsenic	2.8	3.4		0.6	(≤2.1)	
Barium	123	118	4			
Beryllium	0.37	0.45		0.08	(≤0.21)	
Boron	7.5	5.7		1.8	(≤20.9)	
Cadmium	0.075	0.074		0.001	(≤0.10)	
Calcium	27700	27400	1			
Chromium	5.6	4.8		0.8	(≤2.1)	
Cobalt	3.9	5.0	25			
Copper	10.4	11.6	11			
Iron	7730	8810	13			
Lead	6.0	6.1	2			
Magnesium	5960	6780	13			
Manganese	200	242	19			
Molybdenum	0.46	0.44		0.02	(≤1.0)	
Nickel	8.7	10.6	20			
Palladium	0.44	0.47		0.03	(≤0.21)	
Phosphorus	954	1230	25			

LDC#: 18100B4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 3	Concentration (mg/kg) 5	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Potassium	2660	2690	1			
Silicon	268	248	8			
Silver	0.090	0.087		0.003	(≤0.42)	
Sodium	794	444	57			J det / A
Strontium	183	202	10			
Tin	0.39	0.39		0	(≤0.42)	
Titanium	372	334	11			
Tungsten	0.23	0.28		0.05	(≤1.0)	
Uranium	0.87	0.93		0.06	(≤0.21)	
Vanadium	20.8	22.0	6			
Zinc	20.3	20.9	3			
Zirconium	19.1	19.5		0.4	(≤20.9)	
Lithium	10.9	14.9		4	(≤10.4)	
Sulfur	1200	421U		779	(≤1040)	
Mercury (ug/Kg)	37.2	9.9		27.3	(≤34.8)	

Compound	Concentration (mg/kg) 14	Concentration (mg/kg) 15	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	5770	5930	3			
Antimony	0.14	0.13		0.01	(≤1.0)	

LDC#: 18100B4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
	14	15	RPD	Difference	Limits	(Parent Only)
Arsenic	4.5	2.2		2.3	(≤2.1)	J det / A
Barium	117	163	33			
Beryllium	0.44	0.38		0.06	(≤4.1)	
Boron	3.6	3.2		0.4	(≤20.5)	
Cadmium	0.058	0.094		0.036	(≤0.10)	
Calcium	22800	16000	35			
Chromium	6.9	7.1		0.2	(≤0.21)	
Cobalt	5.6	5.6	0			
Copper	10.4	12.7	20			
Iron	9170	10900	17			
Lead	6.5	13.0	67			J det / A
Magnesium	8300	6740	21			
Manganese	231	366	45			
Molybdenum	0.38	0.53		0.15	(≤1.0)	
Nickel	11.1	12.8	14			
Palladium	0.36	0.30		0.06	(≤0.21)	
Phosphorus	712	938	27			
Potassium	2110	2200	4			
Silicon	219	159	32			

LDC#: 18100B4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: ✓
2nd Reviewer: ✓

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

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

Compound	Concentration (mg/kg)		(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	14	15				
Silver	0.10	0.089		0.011	(≤0.41)	
Sodium	484	253	63			J det / A
Strontium	165	142	15			
Tin	0.39	0.48		0.09	(≤0.41)	
Titanium	368	485	27			
Tungsten	0.20U	0.33		0.13	(≤1.0)	
Uranium	0.84	0.77		0.07	(≤0.21)	
Vanadium	23.3	28.8	21			
Zinc	21.4	31.7	39			
Zirconium	18.2	20.5		2.3	(≤20.5)	
Lithium	10.2	11.4		1.2	(≤10.2)	
Mercury (ug/Kg)	9.8	14.5		4.7	(≤34.1)	

LDC #: 18100B4
SDG #: JRNC-9-2

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MM
2nd Reviewer: [illegible]

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

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	S	4220	40000	105.5	105.5	Y
	GFAA (Initial calibration)						
ICV	CVAA (Initial calibration)	Hg	2.46	2.5	98.4	98.4	Y
CCV	ICP (Continuing calibration)	Li	4088.3	4000	102.2	* 102.2	↓
	GFAA (Continuing calibration)						
CCV	CVAA (Continuing calibration)	Hg	4.8	5.0	96.0	96.0	Y
ICV	ICP/MS (Initial calibration)	Mo	205.42	200	102.7	102.7	↓
CCV	ICP/MS (Continuing calibation)	Se	192.6	200	96.3	96.3	↓

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 #: 181-0134
SDG #: TRNC-9-V

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MY
2nd Reviewer: [illegible]

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:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

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

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Cd	97.47	100	97.5	97.5	Y
LCS	Laboratory control sample	B	80.36	97.4	82.5	82.5	
17	Matrix spike	Pb	(SSR-SR) 24.0	25.495	94.1	94.1	
17 DUP	Duplicate	Zn	110.5	105.5	4.7	4.7	
8	ICP serial dilution	Ni	30.258	28.548	6.6	6.0	✓

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 #: 18160B4
SDG #: TRWC-D-Y

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 2
Reviewer: MM
2nd reviewer: [signature]

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 Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for _____ were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$Na = \frac{1357.69\ mg/L \times 0.1\ L \times 2}{0.9457 \times 0.5\ g} = 574.3\ mg/kg$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	Li	14.0	14.0	Y
	S	1450	1450	
	Al	6570	6570	
	Sb	0.13	0.13	
	As	3.1	3.1	
	Ba	134	134	
	Be	0.45	0.45	
	B	9.7	9.7	
	Cd	0.095	0.095	
	Ca	30600	30600	
	Cr	6.1	6.1	
	Co	4.5	4.5	
	Cu	10.5	10.5	
	Fe	9100	9100	
	Pb	7.3	7.2	
	Mg	6810	6810	
	Mn	210	210	
	Mo	0.52	0.52	
	Ni	9.7	9.7	
	Nb	5.3	5.3	
	Pd	0.46	0.46	
	P	743	743	Y

LDC #: 18604B4
SDG #: TRIC-0-V

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: V
2nd reviewer: V

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 Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for _____ were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

Recalculation:

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
*	K	2820	2820	Y
	Si	285	285	
	Ag	0.10	0.10	
	Na	594	594	
	Sr	211	211	
	Sn	0.54	0.54	
	Ti	394	394	
	W	0.53	0.53	
	U	1.0	1.0	
	V	23.1	23.1	
	Zn	22.8	22.8	
	Zr	21.8	21.8	

Revision 1

LDC Report# 18100C4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 8, 2008

Matrix: Soil/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2MS
TSB-DR-06-10'	RINSATE-2MSD
TSB-DR-05-0'	
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

Introduction

This data review covers 19 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 a 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.

Raw data were not reviewed for this SDG. The review was 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

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

*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
ICB/CCB	Cadmium Niobium Tungsten	0.0275 ug/L 9.0 ug/L 0.8 ug/L	All water samples in SDG TRNC-D-3
PB (prep blank)	Barium Boron Niobium Phosphorus Potassium Sodium Thallium Tin Titanium Tungsten Zinc	0.059 mg/Kg 3.5 mg/Kg 1.1 mg/Kg 1.5 mg/Kg 3.3 mg/Kg 6.8 mg/Kg 0.096 mg/Kg 0.092 mg/Kg 0.067 mg/Kg 0.14 mg/Kg 0.91 mg/Kg	All soil samples in SDG TRNC-D-3
ICB/CCB	Arsenic Cadmium Niobium Potassium Thallium Tin Titanium Tungsten Vanadium	0.6 ug/L 0.0275 ug/L 9.0 ug/L 6.7 ug/L 0.5 ug/Kg 0.2 ug/Kg 0.4 ug/Kg 0.8 ug/Kg 0.9 ug/Kg	All soil samples in SDG TRNC-D-3

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-2	Cadmium Niobium Tungsten	0.044 ug/L 16.1 ug/L 1.9 ug/L	0.50U ug/L 2.5U ug/L 5.0U ug/L
TSB-DR-06-0'	Boron Thallium Tungsten	11.5 mg/Kg 0.20 mg/Kg 0.79 mg/Kg	20.2U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-DR-06-10'	Boron Cadmium Niobium Tungsten	7.7 mg/Kg 0.072 mg/Kg 2.0 mg/Kg 0.42 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg
TSB-DR-05-0'	Niobium Thallium Tungsten	1.7 mg/Kg 0.22 mg/Kg 0.43 mg/Kg	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-05-0'-FD	Boron Thallium Tungsten	12.9 mg/Kg 0.21 mg/Kg 0.44 mg/Kg	20.2U mg/Kg 0.40U mg/Kg 1.0U ug/Kg
TSB-DR-05-10'	Boron Cadmium Tungsten	14.1 mg/Kg 0.066 mg/Kg 0.42 mg/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-DR-03-0'	Boron Thallium Tungsten	4.5 mg/Kg 0.16 mg/Kg 0.35 mg/Kg	20.2U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-03-10'	Boron Cadmium Niobium Thallium Tungsten	17.0 mg/Kg 0.10 mg/Kg 1.9 mg/Kg 0.32 mg/Kg 0.63 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
*TSB-DJ-01-0'	Boron Cadmium Thallium Tungsten	4.5 mg/Kg 0.076 mg/Kg 0.23 mg/Kg 0.43 mg/Kg	20.8U mg/Kg *0.10U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	15.8 mg/Kg 0.091 mg/Kg 1.8 mg/Kg 0.20 mg/Kg 0.50 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-DR-04-0'	Boron Thallium Tungsten	5.3 mg/Kg 0.30 mg/Kg 1.0 mg/Kg	20.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-DR-04-10'	Boron Cadmium Tungsten	6.4 mg/Kg 0.083 mg/Kg 0.88 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-CR-04-0'	Boron Thallium Tungsten	9.7 mg/Kg 0.15 mg/Kg 0.37 mg/Kg	20.1U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-04-10'	Boron Cadmium Tungsten	15.3 mg/Kg 0.067 mg/Kg 0.34 mg/Kg	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-CR-05-0'	Boron Tungsten	6.1 mg/Kg 0.32 mg/Kg	21.1U mg/Kg 1.1U mg/Kg
TSB-CR-05-10'	Boron Cadmium Tungsten	8.5 mg/Kg 0.073 mg/Kg 0.35 mg/Kg	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-CR-06-0'	Boron Thallium Tungsten	4.9 mg/Kg 0.19 mg/Kg 0.40 mg/Kg	20.6U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-CR-06-10'	Boron Cadmium Tungsten	8.1 mg/Kg 0.064 mg/Kg 0.32 mg/Kg	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

Sample "RINSATE-2" 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-2	11/12/07	Boron Cadmium Calcium Iron Magnesium Manganese Molybdenum Niobium Potassium Silicon Sodium Strontium Thallium Tin Titanium Tungsten Zinc	18.7 ug/L 0.044 ug/L 269 ug/L 91.0 ug/L 19.8 ug/L 0.84 ug/L 0.59 ug/L 16.1 ug/L 14.9 ug/L 87.7 ug/L 86.1 ug/L 1.3 ug/L 0.74 ug/L 0.40 ug/L 0.42 ug/L 1.9 ug/L 6.2 ug/L	All soil samples in SDG TRNC-D-3

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-DR-06-0'	Boron Molybdenum Thallium Tungsten	11.5 mg/Kg 0.67 mg/Kg 0.20 mg/Kg 0.79 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-DR-06-10'	Boron Cadmium Molybdenum Niobium Tungsten	7.7 mg/Kg 0.072 mg/Kg 0.64 mg/Kg 2.0 mg/Kg 0.42 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 1.1U mg/Kg
TSB-DR-05-0'	Molybdenum Niobium Thallium Tungsten	0.79 mg/Kg 1.7 mg/Kg 0.22 mg/Kg 0.43 mg/Kg	1.0U mg/Kg 5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-05-0'-FD	Boron Molybdenum Thallium Tungsten	12.9 mg/Kg 0.54 mg/Kg 0.21 mg/Kg 0.44 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U ug/Kg
TSB-DR-05-10'	Boron Cadmium Molybdenum Tungsten	14.1 mg/Kg 0.066 mg/Kg 0.56 mg/Kg 0.42 mg/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-DR-03-0'	Boron Molybdenum Thallium Tungsten	4.5 mg/Kg 0.50 mg/Kg 0.16 mg/Kg 0.35 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-03-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	17.0 mg/Kg 0.10 mg/Kg 1.0 mg/Kg 1.9 mg/Kg 0.32 mg/Kg 0.63 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
*TSB-DJ-01-0'	Boron Cadmium Molybdenum Thallium Tungsten	4.5 mg/Kg 0.076 mg/Kg 0.44 mg/Kg 0.23 mg/Kg 0.43 mg/Kg	20.8U mg/Kg *0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	15.8 mg/Kg 0.091 mg/Kg 1.8 mg/Kg 0.20 mg/Kg 0.50 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-DR-04-0'	Boron Molybdenum Thallium Tungsten	5.3 mg/Kg 0.77 mg/Kg 0.30 mg/Kg 1.0 mg/Kg	20.3U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-04-10'	Boron Cadmium Molybdenum Tungsten	6.4 mg/Kg 0.083 mg/Kg 0.61 mg/Kg 0.88 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-04-0'	Boron Molybdenum Thallium Tungsten	9.7 mg/Kg 0.75 mg/Kg 0.15 mg/Kg 0.37 mg/Kg	20.1U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-04-10'	Boron Cadmium Molybdenum Tungsten	15.3 mg/Kg 0.067 mg/Kg 0.65 mg/Kg 0.34 mg/Kg	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-05-0'	Boron Molybdenum Tungsten	6.1 mg/Kg 0.54 mg/Kg 0.32 mg/Kg	21.1U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-05-10'	Boron Cadmium Molybdenum Tungsten	8.5 mg/Kg 0.073 mg/Kg 0.50 mg/Kg 0.35 mg/Kg	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-06-0'	Boron Molybdenum Thallium Tungsten	4.9 mg/Kg 0.59 mg/Kg 0.19 mg/Kg 0.40 mg/Kg	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-CR-06-10'	Boron Cadmium Molybdenum Tungsten	8.1 mg/Kg 0.064 mg/Kg 0.58 mg/Kg 0.32 mg/Kg	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

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-DR-03-0'MSMS/MSD (All soil samples in SDG TRNC-D-3)	Antimony	55.0 (75-125)	54.8 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-DR-03-0'MSMS/MSD (All soil samples in SDG TRNC-D-3)	Niobium Silicon Sulfur	190.8 (75-125) 185.5 (75-125) -	195.7 (75-125) 168.3 (75-125) 128.6 (75-125)	- - -	J+ (all detects) J+ (all detects) J+ (all detects)	A

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	119.6 (85-115)	All water samples in SDG TRNC-D-3	J+ (all detects)	P

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in this SDG.

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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-CR-06-0'L	Aluminum	11.2 (≤10)	All soil samples in SDG TRNC-D-3	J (all detects)	A
	Calcium	10.9 (≤10)		J (all detects)	
	Magnesium	11.1 (≤10)		J (all detects)	
	Manganese	10.2 (≤10)		J (all detects)	
	Phosphorus	13.5 (≤10)		J (all detects)	
	Potassium	10.1 (≤10)		J (all detects)	
	Strontium	17.1 (≤10)		J (all detects)	
	Titanium	10.9 (≤10)		J (all detects)	
	Vanadium	15.2 (≤10)		J (all detects)	

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Aluminum	7700	7650	1 (≤50)	-	-	-
Antimony	0.20	0.19	-	0.01 (≤1.0)	-	-
Arsenic	2.8	2.8	-	0 (≤2.0)	-	-
Barium	174	151	14 (≤50)	-	-	-
Beryllium	0.51	0.50	-	0.01 (≤0.20)	-	-
Boron	22.6	12.9	-	9.7 (≤20.3)	-	-
Cadmium	0.11	0.11	-	0 (≤0.10)	-	-
Calcium	21100	21100	0 (≤50)	-	-	-
Chromium	11.6	11.3	3 (≤50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Cobalt	6.3	7.0	11 (≤50)	-	-	-
Copper	13.3	12.6	5 (≤50)	-	-	-
Iron	13200	12600	5 (≤50)	-	-	-
Lead	10.9	9.5	14 (≤50)	-	-	-
Magnesium	8550	9040	6 (≤50)	-	-	-
Manganese	387	393	2 (≤50)	-	-	-
Molybdenum	0.79	0.54	-	0.25 (≤1.0)	-	-
Nickel	13.9	13.8	1 (≤50)	-	-	-
Niobium	1.7	1.5U	-	0.2 (≤5.1)	-	-
Palladium	0.28	0.27	-	0.01 (≤0.20)	-	-
Phosphorus	845	823	3 (≤50)	-	-	-
Potassium	4170	4480	7 (≤50)	-	-	-
Silicon	384	330	15 (≤50)	-	-	-
Silver	0.11	0.091	-	0.019 (≤0.41)	-	-
Sodium	428	374	13 (≤50)	-	-	-
Strontium	150	141	6 (≤50)	-	-	-
Thallium	0.22	0.21	-	0.01 (≤0.41)	-	-
Tin	0.57	0.52	-	0.05 (≤0.41)	-	-
Titanium	626	542	14 (≤50)	-	-	-
Tungsten	0.43	0.44	-	0.01 (≤1.0)	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Uranium	0.85	0.75	-	0.1 (≤0.20)	-	-
Vanadium	37.1	34.5	7 (≤50)	-	-	-
Zinc	30.8	29.8	3 (≤50)	-	-	-
Zirconium	19.9	15.6	-	4.3 (≤20.3)	-	-
Lithium	11.5	12.6	-	1.1 (≤10.1)	-	-
Sulfur	964	426U	-	538 (≤1010)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Mercury	10.8	12.5	-	1.7 (≤33.8)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Niobium Silicon Sulfur	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
	RINSATE-2	Niobium	J+ (all detects)	P	Laboratory control samples (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Aluminum Calcium Magnesium Manganese Phosphorus Potassium Strontium Titanium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	ICP serial dilution (%D)

*BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	RINSATE-2	Cadmium Niobium Tungsten	0.50U ug/L 2.5U ug/L 5.0U ug/L	A
TRNC-D-3	TSB-DR-06-0'	Boron Thallium Tungsten	20.2U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-06-10'	Boron Cadmium Niobium Tungsten	21.3U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'	Niobium Thallium Tungsten	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'-FD	Boron Thallium Tungsten	20.2U mg/Kg 0.40U mg/Kg 1.0U ug/Kg	A
TRNC-D-3	TSB-DR-05-10'	Boron Cadmium Tungsten	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-03-0'	Boron Thallium Tungsten	20.2U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-03-10'	Boron Cadmium Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
*TRNC-D-3	TSB-DJ-01-0'	Boron Cadmium Thallium Tungsten	20.8U mg/Kg *0.10U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-04-0'	Boron Thallium Tungsten	20.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-04-10'	Boron Cadmium Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-04-0'	Boron Thallium Tungsten	20.1U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-CR-04-10'	Boron Cadmium Tungsten	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-0'	Boron Tungsten	21.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-10'	Boron Cadmium Tungsten	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-06-0'	Boron Thallium Tungsten	20.6U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-CR-06-10'	Boron Cadmium Tungsten	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

*BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-06-0'	Boron Molybdenum Thallium Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-06-10'	Boron Cadmium Molybdenum Niobium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'	Molybdenum Niobium Thallium Tungsten	1.0U mg/Kg 5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'-FD	Boron Molybdenum Thallium Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U ug/Kg	A
TRNC-D-3	TSB-DR-05-10'	Boron Cadmium Molybdenum Tungsten	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-03-0'	Boron Molybdenum Thallium Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-03-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
*TRNC-D-3	TSB-DJ-01-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.8U mg/Kg *0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-04-0'	Boron Molybdenum Thallium Tungsten	20.3U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-04-10'	Boron Cadmium Molybdenum Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-04-0'	Boron Molybdenum Thallium Tungsten	20.1U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-CR-04-10'	Boron Cadmium Molybdenum Tungsten	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-0'	Boron Molybdenum Tungsten	21.1U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-10'	Boron Cadmium Molybdenum Tungsten	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-06-0'	Boron Molybdenum Thallium Tungsten	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-CR-06-10'	Boron Cadmium Molybdenum Tungsten	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

LDC #: 18100C4
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/16/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: [illegible]

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

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	A	Sampling dates: 11/13/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3 MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(3, 4)
XIV.	Field Blanks	SW	R=18

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: All soil except # 18, 21, w/ Aq

1	TSB-DR-06-0'	11	TSB-DR-04-10'	21	RINSTATE-2MS Aq	31	
2	TSB-DR-06-10'	12	TSB-CR-04-0'	22	RINSTATE-2MSD ↓	32	
3	TSB-DR-05-0'	13	TSB-CR-04-10'	23	PB	33	
4	TSB-DR-05-0'-FD	14	TSB-CR-05-0'	24		34	
5	TSB-DR-05-10'	15	TSB-CR-05-10'	25		35	
6	TSB-DR-03-0'	16	TSB-CR-06-0'	26		36	
7	TSB-DR-03-10'	17	TSB-CR-06-10'	27		37	
8	TSB-DJ-01-0'	18	RINSATE-2 Aq	28		38	
9	TSB-DJ-01-10'	19	TSB-DR-03-0'MS	29		39	
10	TSB-DR-04-0'	20	TSB-DR-03-0'MSD	30		40	

Notes: _____

LDC #: 18100C4
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: g

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-18	Soil/Aq	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, ___ ___
19,20	Soil	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, ___ ___
21,22	Aq	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, 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, ___ ___
1-18	Soil/Aq	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr, ___ ___
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr, ___ ___
19,20	Soil	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr, ___ ___
21,22	Aq	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, ___ ___
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr, ___ ___

Analysis Method

ICP		Li, S, ___ ___
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, ___ ___
GFAA		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, CN⁻

Comments: Mercury by CVAA if performed
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18100C4
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:
Associated Samples: All AQ

Reviewer:
2nd Reviewer:

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	18									
Cd			0.0275		0.044 / 0.50									
Nb			9.0		16.1 / 25.0									
W			0.8		1.9 / 5.0									

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 #: 18100C4
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Sample Concentration units, unless otherwise noted: mg/Kg
Associated Samples: All Soil

				Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10
As		0.6											
Ba	0.059												
B	3.5			11.5 / 20.2	7.7 / 21.3		12.9 / 20.2	14.1 / 22.0	4.5 / 20.2	17.0 / 21.4	4.5 / 20.8	15.8 / 21.4	5.3 / 20.3
Cd		0.0275			0.072 / 0.11			0.066 / 0.11		0.10 / 0.11	0.076 / 0.10	0.091 / 0.11	
Nb	1.1	9.0			2.0 / 5.3	1.7 / 5.1				1.9 / 5.3		1.8 / 5.4	
P	1.5												
K	3.3	6.7											
Na	6.8												
Tl	0.096	0.5		0.20 / 0.40		0.22 / 0.41	0.21 / 0.40		0.16 / 0.41	0.32 / 0.43	0.23 / 0.42	0.20 / 0.43	0.30 / 0.41
Sn	0.092	0.2											
Ti	0.067	0.4											
W	0.14	0.8		0.79 / 1.0	0.42 / 1.1	0.43 / 1.0	0.44 / 1.0	0.42 / 1.1	0.35 / 1.0	0.63 / 1.1	0.43 / 1.0	0.50 / 1.1	1.0 / 1.0
V		0.9											
Zn	0.91												

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 #: 18100C4
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000) Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All Soil

				Sample Identification									
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum ICB/CCB[a] (ug/L)**	**Blank Action Limit**	11	12	13	14	15	16	17			
As		0.6											
Ba	0.059												
B	3.5			6.4 / 21.2	9.7 / 20.1	15.3 / 22.4	6.1 / 21.1	8.5 / 21.6	4.9 / 20.6	8.1 / 21.9			
Cd		0.0275		0.083 / 0.11		0.067 / 0.11		0.073 / 0.11		0.064 / 0.11			
Nb	1.1	9.0											
P	1.5												
K	3.3	6.7											
Na	6.8												
Tl	0.096	0.5			0.15 / 0.40				0.19 / 0.41				
Sn	0.092	0.2											
Ti	0.067	0.4											
W	0.14	0.8		0.88 / 1.1	0.37 / 1.0	0.34 / 1.1	0.32 / 1.1	0.35 / 1.1	0.40 / 1.0	0.32 / 1.1			
V		0.9											
Zn	0.91												

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 #: 18100C4
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: L
2nd Reviewer: Q

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
(Y) N N/A Were field blanks identified in this SDG?
Ø N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /12 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	18	Action Level	1	2	3	4	5	6	7	8	9	10
B	18.7		11.5 / 20.2	7.7 / 21.3		12.9 / 20.2	14.1 / 22.0	4.5 / 20.2	17.0 / 21.4	4.5 / 20.8	15.8 / 21.4	5.3 / 20.3
Cd	0.044			0.072 / 0.11			0.066 / 0.11		0.10 / 0.11	0.076 / 0.10	0.091 / 0.11	
Ca	269	538										
Fe	91.0	182										
Mg	19.8											
Mn	0.84											
Mo	0.59		0.67 / 1.0	0.64 / 1.1	0.79 / 1.0	0.54 / 1.0	0.56 / 1.1	0.50 / 1.0	1.0 / 1.1	0.44 / 1.0		0.77 / 1.0
Nb	16.1			2.0 / 5.3	1.7 / 5.1				1.9 / 5.3		1.8 / 5.4	
K	14.9											
Si	87.7											
Na	86.1	172.2										
Sr	1.3											
Tl	0.74		0.20 / 0.40		0.22 / 0.41	0.21 / 0.40		0.16 / 0.41	0.32 / 0.43	0.23 / 0.42	0.20 / 0.43	0.30 / 0.41
Sn	0.40											
Ti	0.42											
W	1.9		0.79 / 1.0	0.42 / 1.1	0.43 / 1.0	0.44 / 1.0	0.42 / 1.1	0.35 / 1.0	0.63 / 1.1	0.43 / 1.0	0.50 / 1.1	1.0 / 1.0
Zn	6.2											

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".

LDC #: 18100C4
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /12 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	18	Action Level	11	12	13	14	15	16	17			
B	18.7		6.4 / 21.2	9.7 / 20.1	15.3 / 22.4	6.1 / 21.1	8.5 / 21.6	4.9 / 20.6	8.1 / 21.9			
Cd	0.044		0.083 / 0.11		0.067 / 0.11		0.073 / 0.11		0.064 / 0.11			
Ca	269	538										
Fe	91.0	182										
Mg	19.8											
Mn	0.84											
Mo	0.59		0.61 / 1.1	0.75 / 1.0	0.65 / 1.1	0.54 / 1.1	0.50 / 1.1	0.59 / 1.0	0.58 / 1.1			
Nb	16.1											
K	14.9											
Si	87.7											
Na	86.1	172.2										
Sr	1.3											
Tl	0.74			0.15 / 0.40				0.19 / 0.41				
Sn	0.40											
Ti	0.42											
W	1.9		0.88 / 1.1	0.37 / 1.0	0.34 / 1.1	0.32 / 1.1	0.35 / 1.1	0.40 / 1.0	0.32 / 1.1			
Zn	6.2											

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".

LDC #: 18104C4
SDG #: TRVC4-3

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MM
2nd Reviewer: [signature]

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 a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	21/22	Aq	Li			25.7 (≤20)	All Aq	No qual (MS/MSD acceptable)
			S			x4.6 ↓	↓	↓ ↓
2	19/20	Soil	Sb	55.0	54.8		All Soil	J-/UJ/A
			Nb	190.8	195.7			J+ det/A
			Si	185.5	168.3		↓	↓
			S		128.6			

Comments: _____

LDC #: 18108c4
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: MH
2nd Reviewer: [illegible]

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 a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

OAPP limits

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	Aa	Nb	119.6 (85-115)	A-1 Aa	J+ (all) / P

Comments:

LDC #: 18100c4
SDG #: JRNC-D-3

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

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 If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed? >100X but for 24 Ag
Y N N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	6	Soil	Al	11.2	All soil	~~Soil~~ J+ (A)
			Ca	10.9		
			Mg	11.1		
			Mn	10.2		
			P	13.5		
			K	10.1		
			Sr	17.1		
			Ti	10.9		
			V	15.2		

Comments: Cr, Cu, Ni, Zn <LOQ Mg ✓

SDIL4S2

LDC#: 18100C4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Compound	Concentration (mg/kg)		(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	3	4				
Aluminum	7700	7650	1			
Antimony	0.20	0.19		0.01	(≤1.0)	
Arsenic	2.8	2.8		0	(≤2.0)	
Barium	174	151	14			
Beryllium	0.51	0.50		0.01	(≤0.20)	
Boron	22.6	12.9		9.7	(≤20.3)	
Cadmium	0.11	0.11		0	(≤0.10)	
Calcium	21100	21100	0			
Chromium	11.6	11.3	3			
Cobalt	6.3	7.0	11			
Copper	13.3	12.6	5			
Iron	13200	12600	5			
Lead	10.9	9.5	14			
Magnesium	8550	9040	6			
Manganese	387	393	2			
Molybdenum	0.79	0.54		0.25	(≤1.0)	
Nickel	13.9	13.8	1			
Niobium	1.7	1.5U		0.2	(≤5.1)	
Palladium	0.28	0.27		0.01	(≤0.20)	

LDC#: 18100C4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: V
2nd Reviewer: [illegible]

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

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

Compound	Concentration (mg/kg) 3	Concentration (mg/kg) 4	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Phosphorus	845	823	3			
Potassium	4170	4480	7			
Silicon	384	330	15			
Silver	0.11	0.091		0.019	(≤0.41)	
Sodium	428	374	13			
Strontium	150	141	6			
Thallium	0.22	0.21		0.01	(≤0.41)	
Tin	0.57	0.52		0.05	(≤0.41)	
Titanium	626	542	14			
Tungsten	0.43	0.44		0.01	(≤1.0)	
Uranium	0.85	0.75		0.1	(≤0.20)	
Vanadium	37.1	34.5	7			
Zinc	30.8	29.8	3			
Zirconium	19.9	15.6		4.3	(≤20.3)	
Lithium	11.5	12.6		1.1	(≤10.1)	
Sulfur	964	426U		538	(≤1010)	
Mercury (ug/Kg)	10.8	12.5		1.7	(≤33.8)	

LDC Report# 18100D4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 22, 2008

Matrix: Soil

Parameters: Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW DITCH01-0'
JB-NW DITCH01-10'
TSB-FR-01-0'MS
TSB-FR-01-0'MSD

Introduction

This data review covers 18 soil 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 a 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.

Raw data were not reviewed for this SDG. The review was 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

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

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)	Copper Manganese Phosphorus Potassium Sodium Tin Titanium Zinc Zirconium	0.11 mg/Kg 0.16 mg/Kg 0.99 mg/Kg 2.2 mg/Kg 4.0 mg/Kg 0.042 mg/Kg 0.11 mg/Kg 1.3 mg/Kg 0.30 mg/Kg	All samples in SDG TRNC-D-4
ICB/CCB	Arsenic Cadmium Niobium Phosphorus Potassium Thallium Tin Titanium Tungsten Vanadium	0.6 ug/L 0.0275 ug/L 9.0 ug/L 4.0 ug/L 7.3 ug/L 0.5 ug/L 0.2 ug/L 0.4 ug/L 0.8 ug/L 1.1 ug/L	All samples in SDG TRNC-D-4

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
TSB-FR-01-0'	Thallium	0.27 mg/Kg	0.42U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FR-01-10'	Cadmium Niobium Thallium Tungsten Zirconium	0.082 mg/Kg 2.5 mg/Kg 0.36 mg/Kg 0.72 mg/Kg 20.6 mg/Kg	0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg
TSB-FJ-07-0'	Thallium Tungsten	0.21 mg/Kg 0.59 mg/Kg	0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-07-10'	Cadmium Tungsten	0.092 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FJ-06-0'	Thallium Tungsten	0.17 mg/Kg 0.67 mg/Kg	0.41U mg/Kg 1.0U mg/Kg
TSB-FJ-06-0'-FD	Niobium Thallium Tungsten	1.7 mg/Kg 0.22 mg/Kg 0.60 mg/Kg	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-FJ-06-10'	Cadmium Tungsten	0.073 mg/Kg 0.35 mg/Kg	0.10U mg/Kg 1.0U mg/Kg
TSB-FJ-05-0'	Tungsten Zirconium	0.37 mg/Kg 21.0 mg/Kg	1.1U mg/Kg 21.6U mg/Kg
TSB-FJ-05-10'	Cadmium Tungsten	0.084 mg/Kg 0.41 mg/Kg	0.10U mg/Kg 1.0U mg/Kg
TSB-DR-01-0'	Tungsten Zirconium	0.29 mg/Kg 19.4 mg/Kg	1.0U mg/Kg 20.4U mg/Kg
TSB-DR-01-10'	Cadmium Tin Tungsten Zirconium	0.071 mg/Kg 0.41 mg/Kg 0.33 mg/Kg 18.9 mg/Kg	0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 21.0U mg/Kg
TSB-DR-02-0'	Thallium Tungsten	0.14 mg/Kg 0.31 mg/Kg	0.40U mg/Kg 1.0U mg/Kg
TSB-DR-02-10'	Cadmium Tungsten	0.080 mg/Kg 0.40 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-DR-02-0'-FD	Tungsten	0.28 mg/Kg	1.0U mg/Kg
JB-NW DITCH01-10'	Cadmium Tungsten Zirconium	0.041 mg/Kg 0.44 mg/Kg 18.7 mg/Kg	0.11U mg/Kg 1.1U mg/Kg 22.1U mg/Kg

No field blanks were identified in this SDG.

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-FR-01-0'MS/MSD (All samples in SDG TRNC-D-4)	Sulfur Niobium	130.8 (75-125) 134.7 (75-125)	- -	- -	J+ (all detects) J+ (all detects)	A
TSB-FR-01-0'MS/MSD (All samples in SDG TRNC-D-4)	Antimony Cobalt Nickel Potassium Sodium Zirconium Tungsten	49.0 (75-125) 68.7 (75-125) 47.0 (75-125) 38.1 (75-125) 35.1 (75-125) 71.0 (75-125) -	42.78 (75-125) 66.7 (75-125) 45.6 (75-125) 44.8 (75-125) 64.4 (75-125) 62.3 (75-125) 68.9 (75-125)	- - - - - - -	J- (all detects) UJ (all non-detects)	A
TSB-FR-01-0'MS/MSD (All samples in SDG TRNC-D-4)	Barium Chromium Copper Phosphorus Vanadium Zinc Silicon	-31.5 (75-125) 20.8 (75-125) -0.6 (75-125) -46.6 (75-125) -12.6 (75-125) 16.3 (75-125) -	-31.3 (75-125) 29.9 (75-125) -5.6 (75-125) -66.2 (75-125) -19.7 (75-125) 9.6 (75-125) -10.5 (75-125)	- - - - - - -	J- (all detects) R (all non-detects)	A

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.

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in this SDG.

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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-FR-01-0'L	Barium Vanadium	11.9 (≤10) 10.5 (≤10)	All samples in SDG TRNC-D-4	J (all detects) J (all detects)	A

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Aluminum	6380 mg/Kg	8580 mg/Kg	29 (≤50)	-	-	-
Antimony	0.29 mg/Kg	0.32 mg/Kg	-	0.03 mg/Kg (≤1.0)	-	-
Arsenic	5.0 mg/Kg	6.9 mg/Kg	-	1.9 mg/Kg (≤2.1)	-	-
Barium	859 mg/Kg	629 mg/Kg	31 (≤50)	-	-	-
Beryllium	0.49 mg/Kg	0.58 mg/Kg	-	0.09 mg/Kg (≤0.21)	-	-
Boron	12.4 mg/Kg	13.4 mg/Kg	-	1 mg/Kg (≤20.6)	-	-
Cadmium	0.23 mg/Kg	0.25 mg/Kg	-	0.02 mg/Kg (≤0.10)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Calcium	66200 mg/Kg	30900 mg/Kg	73 (≤50)	-	J (all detects)	A
Chromium	15.4 mg/Kg	17.2 mg/Kg	11 (≤50)	-	-	-
Cobalt	10.2 mg/Kg	8.6 mg/Kg	17 (≤50)	-	-	-
Copper	19.2 mg/Kg	25.1 mg/Kg	27 (≤50)	-	-	-
Iron	12900 mg/Kg	15000 mg/Kg	15 (≤50)	-	-	-
Lead	38.5 mg/Kg	39.8 mg/Kg	3 (≤50)	-	-	-
Magnesium	10300 mg/Kg	12600 mg/Kg	20 (≤50)	-	-	-
Manganese	775 mg/Kg	671 mg/Kg	14 (≤50)	-	-	-
Molybdenum	1.1 mg/Kg	0.92 mg/Kg	-	0.18 mg/Kg (≤1.0)	-	-
Nickel	16.5 mg/Kg	16.5 mg/Kg	0 (≤50)	-	-	-
Niobium	1.6U mg/Kg	1.7 mg/Kg	-	0.1 mg/Kg (≤5.2)	-	-
Palladium	0.29 mg/Kg	0.30 mg/Kg	-	0.01 mg/Kg (≤0.21)	-	-
Phosphorus	934 mg/Kg	951 mg/Kg	2 (≤50)	-	-	-
Platinum	0.15 mg/Kg	0.021 mg/Kg		0.129 mg/Kg (≤0.21)	-	-
Potassium	1680 mg/Kg	2270 mg/Kg	30 (≤50)	-	-	-
Silicon	149 mg/Kg	426 mg/Kg	-	277 mg/Kg (≤51.6)	J (all detects)	A
Silver	0.13 mg/Kg	0.15 mg/Kg	-	0.02 mg/Kg (≤0.41)	-	-
Sodium	845 mg/Kg	1730 mg/Kg	69 (≤50)	-	J (all detects)	A
Strontium	150 mg/Kg	167 mg/Kg	11 (≤50)	-	-	-
Thallium	0.17 mg/Kg	0.22 mg/Kg	-	0.05 mg/Kg (≤0.41)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Tin	1.1 mg/Kg	1.1 mg/Kg	-	0 mg/Kg (≤0.41)	-	-
Titanium	576 mg/Kg	701 mg/Kg	20 (≤50)	-	-	-
Tungsten	0.67 mg/Kg	0.60 mg/Kg	-	0.07 mg/Kg (≤1.0)	-	-
Uranium	1.0 mg/Kg	1.2 mg/Kg	-	0.2 mg/Kg (≤0.21)	-	-
Vanadium	41.8 mg/Kg	47.6 mg/Kg	13 (≤50)		-	-
Zinc	61.8 mg/Kg	67.1 mg/Kg	8 (≤50)	-	-	-
Zirconium	21.6 mg/Kg	25.9 mg/Kg	-	4.3 mg/Kg (≤20.6)	-	-
Lithium	11.2 mg/Kg	12.0 mg/Kg	-	0.8 mg/Kg (≤10.3)	-	-
Sulfur	919 mg/Kg	893 mg/Kg	-	26 mg/Kg (≤1030)	-	-
Mercury	10.5 ug/Kg	41.3 ug/Kg	-	30.8 ug/Kg (≤34.4)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Aluminum	7760 mg/Kg	8170 mg/Kg	5 (≤50)	-	-	-
Antimony	0.15 mg/Kg	0.18 mg/Kg	-	0.03 mg/Kg (≤1.0)	-	-
Arsenic	2.9 mg/Kg	3.1 mg/Kg	-	0.2 mg/Kg (≤2.0)	-	-
Barium	168 mg/Kg	171 mg/Kg	2 (≤50)	-	-	-
Beryllium	0.49 mg/Kg	0.55 mg/Kg	-	0.06 mg/Kg (≤0.20)	-	-
Boron	5.0 mg/Kg	5.8 mg/Kg	-	0.8 mg/Kg (≤20.3)	-	-
Cadmium	0.11 mg/Kg	0.11 mg/Kg	-	0 mg/Kg (≤0.10)	-	-
Calcium	22400 mg/Kg	20900 mg/Kg	7 (≤50)	-	-	-
Chromium	10.8 mg/Kg	10.8 mg/Kg	0 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Cobalt	5.9 mg/Kg	6.6 mg/Kg	11 (≤50)	-	-	-
Copper	12.1 mg/Kg	13.9 mg/Kg	14 (≤50)	-	-	-
Iron	11800 mg/Kg	12800 mg/Kg	8 (≤50)	-	-	-
Lead	13.9 mg/Kg	10.9 mg/Kg	24 (≤50)	-	-	-
Magnesium	8140 mg/Kg	8120 mg/Kg	0 (≤50)	-	-	-
Manganese	390 mg/Kg	348 mg/Kg	11 (≤50)	-	-	-
Molybdenum	0.55 mg/Kg	0.49 mg/Kg	-	0.06 mg/Kg (≤1.0)	-	-
Nickel	13.6 mg/Kg	15.5 mg/Kg	13 (≤50)	-	-	-
Palladium	0.26 mg/Kg	0.26 mg/Kg	-	0 mg/Kg (≤0.20)	-	-
Phosphorus	757 mg/Kg	1030 mg/Kg	31 (≤50)	-	-	-
Potassium	3130 mg/Kg	2920 mg/Kg	7 (≤50)		-	-
Silicon	256 mg/Kg	259 mg/Kg	1 (≤50)	-	-	-
Silver	0.094 mg/Kg	0.11 mg/Kg	-	0.016 mg/Kg (≤0.41)	-	-
Sodium	247 mg/Kg	533 mg/Kg	73 (≤50)		J (all detects)	A
Strontium	149 mg/Kg	147 mg/Kg	1 (≤50)	-	-	-
Thallium	0.14 mg/Kg	0.14U mg/Kg	-	0 mg/Kg (≤0.41)	-	-
Tin	0.55 mg/Kg	0.58 mg/Kg	-	0.03 mg/Kg (≤0.41)	-	-
Titanium	600 mg/Kg	614 mg/Kg	2 (≤50)	-	-	-
Tungsten	0.31 mg/Kg	0.28 mg/Kg	-	0.03 mg/Kg (≤1.0)	-	-
Uranium	0.75 mg/Kg	0.91 mg/Kg	-	0.16 mg/Kg (≤0.20)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Vanadium	33.2 mg/Kg	35.9 mg/Kg	8 (≤50)	-	-	-
Zinc	29.8 mg/Kg	32.7 mg/Kg	9 (≤50)	-	-	-
Zirconium	21.3 mg/Kg	22.6 mg/Kg	-	1.3 mg/Kg (≤20.3)	-	-
Lithium	13.2 mg/Kg	12.0 mg/Kg	-	1.2 mg/Kg (≤10.2)	-	-
Sulfur	425U mg/Kg	470 mg/Kg	-	45 mg/Kg (≤1020)	-	-
Mercury	15.3 ug/Kg	17.5 ug/Kg	-	2.2 ug/Kg (≤33.9)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Sulfur Niobium	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Antimony Cobalt Nickel Potassium Sodium Zirconium Tungsten	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Barium Chromium Copper Phosphorus Vanadium Zinc Silicon	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Barium Vanadium	J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Calcium Sodium	J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Silicon	J (all detects)	A	Field duplicates (Difference)
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	Sodium	J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-4	TSB-FR-01-0'	Thallium	0.42U mg/Kg	A
TRNC-D-4	TSB-FR-01-10'	Cadmium Niobium Thallium Tungsten Zirconium	0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg	A
TRNC-D-4	TSB-FJ-07-0'	Thallium Tungsten	0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-4	TSB-FJ-07-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-4	TSB-FJ-06-0'	Thallium Tungsten	0.41U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-4	TSB-FJ-06-0'-FD	Niobium Thallium Tungsten	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-FJ-06-10'	Cadmium Tungsten	0.10U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-FJ-05-0'	Tungsten Zirconium	1.1U mg/Kg 21.6U mg/Kg	A
TRNC-D-4	TSB-FJ-05-10'	Cadmium Tungsten	0.10U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-DR-01-0'	Tungsten Zirconium	1.0U mg/Kg 20.4U mg/Kg	A
TRNC-D-4	TSB-DR-01-10'	Cadmium Tin Tungsten Zirconium	0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 21.0U mg/Kg	A
TRNC-D-4	TSB-DR-02-0'	Thallium Tungsten	0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-DR-02-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-4	TSB-DR-02-0'-FD	Tungsten	1.0U mg/Kg	A
TRNC-D-4	JB-NW DITCH01-1 0'	Cadmium Tungsten Zirconium	0.11U mg/Kg 1.1U mg/Kg 22.1U mg/Kg	A

BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D4
SDG #: TRNC-D-4
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/17/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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	A	Sampling dates: 11/14/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(5,6) (12,14)
XIV.	Field Blanks	N	

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: soil

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21		31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22		32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17	TSB-FR-01-0'MS	27		37	
8	TSB-FJ-05-0'	18	TSB-FR-01-0'MSD	28		38	
9	TSB-FJ-05-10'	19	PB	29		39	
10	TSB-DR-01-0'	20		30		40	

Notes: _____

LDC #: 18100D4
SDG #: TRNC-D-4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-16	Soil	[✓ 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,
17, 18	Soil	[✓ 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, 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,
1-16	Soil	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr]
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
17, 18	Soil	[✓ 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,
		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, S]
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]
GFAA		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, CN⁻,

Comments: [✓ Mercury by CVAA if performed]
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18100D4
SDG #: TRNC-D-4
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All

Reviewer: [illegible]
2nd Reviewer: [illegible]

				Sample Identification									
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum ICB/CCB[a] (ug/L)**	**Blank Action Limit**	1	2	3	4	5	6	7	8	9	10
As		0.6											
Cd		0.0275			0.082 / 0.11		0.092 / 0.11			0.073 / 0.10		0.084 / 0.10	
Cu	0.11												
Mn	0.16												
Nb		9.0			2.5 / 5.3				1.7 / 5.1				
P	0.99	4.0											
K	2.2	7.3											
Na	4.0												
Tl		0.5		0.27 / 0.42	0.36 / 0.43	0.21 / 0.43		0.17 / 0.41	0.22 / 0.41				
Sn	0.042	0.2											
Ti	0.11	0.4											
W		0.8			0.72 / 1.1	0.59 / 1.1	0.36 / 1.1	0.67 / 1.0	0.60 / 1.0	0.35 / 1.0	0.37 / 1.1	0.41 / 1.0	0.29 / 1.0
V		1.1											
Zn	1.3												
Zr	0.30				20.6 / 21.3						21.0 / 21.6		19.4 / 20.4

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 #: 18100D4
SDG #: TRNC-D-4
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All

Reviewer:
2nd Reviewer:

				Sample Identification										
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum ICB/CCB[a] (ug/L)**	**Blank Action Limit**	11	12	13	14	16						
As		0.6												
Cd		0.0275		0.071 / 0.11		0.080 / 0.11		0.041 / 0.11						
Cu	0.11													
Mn	0.16													
Nb		9.0												
P	0.99	4.0												
K	2.2	7.3												
Na	4.0													
Tl		0.5			0.14 / 0.40									
Sn	0.042	0.2		0.41 / 0.42										
Ti	0.11	0.4												
W		0.8		0.33 / 1.1	0.31 / 1.0	0.40 / 1.1	0.28 / 1.0	0.44 / 1.1						
V		1.1												
Zn	1.3													
Zr	0.30			18.9 / 21.0				18.7 / 22.1						

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 #: 18600D4
SDG #: TRNC-04

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MM
2nd Reviewer: [illegible]

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 a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	19/18	Soil	S	130.8			All	J+ UJ+ /A
			Sb	49.0	42.7			J- /UJ /A
			Ba	-31.5	-31.3			J- /R /A
			Cr	20.8	29.9			↓
			Co	68.7	66.7			J- /UJ /A
			Cu	-0.6	-5.6			J- /R /A
			Ni	47.0	45.6			J- /UJ /A
			Nb	134.7				J+ UJ+ /A
			P	-46.6	-66.2			J- /R /A
			K	38.1	44.8			J- /UJ /A
			Na	65.1	64.4			↓
			V	-12.6	-19.7			J- /R /A
			Zn	16.3	9.6			↓
			~~Zr~~	71.0	62.3			J- /UJ /A
			Si		-10.5			J- /R /A
			W		68.9		↓	J- /UJ /A
			Mn			27.2 (≤20)		N, Gwl LCS, jm
			Si			27.7 ↓		↓

Comments: _____

LDC #: 18100D4
SDG #: TRNC-D-4

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

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 If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed? > 100X MDL for ICP/MS

Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?

Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Soil	Ba	11.9	A11	J (+)/A
			V	10.5		

Comments: Cr < 100X MDL

SDIL4S2

LDC#: 18100D4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 5	Concentration (mg/kg) 6	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	6380	8580	29			
Antimony	0.29	0.32		0.03	(≤1.0)	
Arsenic	5.0	6.9		1.9	(≤2.1)	
Barium	859	629	31			
Beryllium	0.49	0.58		0.09	(≤0.21)	
Boron	12.4	13.4		1	(≤20.6)	
Cadmium	0.23	0.25		0.02	(≤0.10)	
Calcium	66200	30900	73			J det / A
Chromium	15.4	17.2	11			
Cobalt	10.2	8.6	17			
Copper	19.2	25.1	27			
Iron	12900	15000	15			
Lead	38.5	39.8	3			
Magnesium	10300	12600	20			
Manganese	775	671	14			
Molybdenum	1.1	0.92		0.18	(≤1.0)	
Nickel	16.5	16.5	0			
Niobium	1.6U	1.7		0.1	(≤5.2)	
Palladium	0.29	0.30		0.01	(≤0.21)	

LDC#: 18100D4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 5	Concentration (mg/kg) 6	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Phosphorus	934	951	2			
Platinum	0.15	0.021		0.129	(≤0.21)	
Potassium	1680	2270	30			
Silicon	149	426		277	(≤51.6)	J det / A
Silver	0.13	0.15		0.02	(≤0.41)	
Sodium	845	1730	69			J det / A
Strontium	150	167	11			
Thallium	0.17	0.22		0.05	(≤0.41)	
Tin	1.1	1.1		0	(≤0.41)	
Titanium	576	701	20			
Tungsten	0.67	0.60		0.07	(≤1.0)	
Uranium	1.0	1.2		0.2	(≤0.21)	
Vanadium	41.8	47.6	13			
Zinc	61.8	67.1	8			
Zirconium	21.6	25.9		4.3	(≤20.6)	
Lithium	11.2	12.0		0.8	(≤10.3)	
Sulfur	919	893		26	(≤1030)	
Mercury (ug/Kg)	10.5	41.3		30.8	(≤34.4)	

LDC#: 18100D4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 12	Concentration (mg/kg) 14	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	7760	8170	5			
Antimony	0.15	0.18		0.03	(≤1.0)	
Arsenic	2.9	3.1		0.2	(≤2.0)	
Barium	168	171	2			
Beryllium	0.49	0.55		0.06	(≤0.20)	
Boron	5.0	5.8		0.8	(≤20.3)	
Cadmium	0.11	0.11		0	(≤0.10)	
Calcium	22400	20900	7			
Chromium	10.8	10.8	0			
Cobalt	5.9	6.6	11			
Copper	12.1	13.9	14			
Iron	11800	12800	8			
Lead	13.9	10.9	24			
Magnesium	8140	8120	0			
Manganese	390	348	11			
Molybdenum	0.55	0.49		0.06	(≤1.0)	
Nickel	13.6	15.5	13			
Palladium	0.26	0.26		0	(≤0.20)	
Phosphorus	757	1030	31			

LDC#: 18100D4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 12	Concentration (mg/kg) 14	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Potassium	3130	2920	7			
Silicon	256	259	1			
Silver	0.094	0.11		0.016	(≤0.41)	
Sodium	247	533	73			J det / A
Strontium	149	147	1			
Thallium	0.14	0.14U		0	(≤0.41)	
Tin	0.55	0.58		0.03	(≤0.41)	
Titanium	600	614	2			
Tungsten	0.31	0.28		0.03	(≤1.0)	
Uranium	0.75	0.91		0.16	(≤0.20)	
Vanadium	33.2	35.9	8			
Zinc	29.8	32.7	9			
Zirconium	21.3	22.6		1.3	(≤20.3)	
Lithium	13.2	12.0		1.2	(≤10.2)	
Sulfur	425U	470		45	(≤1020)	
Mercury (ug/Kg)	15.3	17.5		2.2	(≤33.9)	

LDC Report# 18100E4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 21, 2008

Matrix: Soil/Water

Parameters: Metals

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-10'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**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 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.

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
ICB/CCB	Cadmium Niobium Tungsten	0.0275 ug/L 9.0 ug/L 0.8 ug/L	All water samples in SDG TRNC-D-5
PB (prep blank)	Barium Boron Iron Molybdenum Phosphorus Sodium Tin Vanadium Zinc Zirconium	0.13 mg/Kg 1.5 mg/Kg 3.0 mg/Kg 0.058 mg/Kg 1.3 mg/Kg 4.3 mg/Kg 0.032 mg/Kg 0.27 mg/Kg 1.0 mg/Kg 0.31 mg/Kg	All soil samples in SDG TRNC-D-5
ICB/CCB	Boron Cadmium Nickel Niobium Thallium Tin Tungsten Vanadium Mercury	12.8 ug/L 0.045 ug/L 0.5 ug/L 9.2 ug/L 0.7 ug/L 0.2 ug/L 1.3 ug/L 1.9 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-5

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-3	Niobium Tungsten	19.7 ug/L 2.6 ug/L	25.0U ug/L 5.0U ug/L
TSB-FJ-03-0'**	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	10.0 mg/Kg 0.073 mg/Kg 0.47 mg/Kg 0.19 mg/Kg 0.81 mg/Kg 17.3 mg/Kg 15.7 ug/Kg	20.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 20.9U mg/Kg 34.9U ug/Kg
TSB-FJ-03-0'-FD**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	8.1 mg/Kg 0.10 mg/Kg 0.37 mg/Kg 4.3 mg/Kg 0.21 mg/Kg 0.39 mg/Kg 17.0 mg/Kg 16.7 ug/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.4U ug/Kg
TSB-FJ-03-10'**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	5.5 mg/Kg 0.075 mg/Kg 0.62 mg/Kg 2.5 mg/Kg 0.16 mg/Kg 0.41 mg/Kg 19.1 mg/Kg 14.2 ug/Kg	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.6U mg/Kg 35.9U ug/Kg
TSB-FJ-10-0'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	9.7 mg/Kg 0.092 mg/Kg 0.97 mg/Kg 0.34 mg/Kg 0.53 mg/Kg 17.3 ug/Kg	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.6U ug/Kg
TSB-FJ-10-10'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	11.9 mg/Kg 0.071 mg/Kg 0.67 mg/Kg 0.16 mg/Kg 0.29 mg/Kg 11.5 ug/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-FJ-04-0'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	5.5 mg/Kg 0.080 mg/Kg 0.46 mg/Kg 0.21 mg/Kg 0.36 mg/Kg 13.8 ug/Kg	21.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.0U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-04-10'**	Boron	7.8 mg/Kg	21.5U mg/Kg
	Cadmium	0.038 mg/Kg	0.11U mg/Kg
	Molybdenum	0.37 mg/Kg	1.1U mg/Kg
	Thallium	0.16 mg/Kg	0.43U mg/Kg
	Tungsten	0.22 mg/Kg	1.1U mg/Kg
	Zirconium	18.8 mg/Kg	21.5U mg/Kg
	Mercury	9.8 ug/Kg	35.8U ug/Kg
TSB-FJ-02-0'**	Boron	4.6 mg/Kg	21.3U mg/Kg
	Cadmium	0.10 mg/Kg	0.11U mg/Kg
	Molybdenum	0.51 mg/Kg	1.1U mg/Kg
	Thallium	0.20 mg/Kg	0.43U mg/Kg
	Tungsten	0.28 mg/Kg	1.1U mg/Kg
	Zirconium	18.6 mg/Kg	21.3U mg/Kg
	Mercury	10.1 ug/Kg	35.5U ug/Kg
TSB-FJ-02-0'-FD**	Cadmium	0.055 mg/Kg	0.10U mg/Kg
	Molybdenum	0.37 mg/Kg	1.0U mg/Kg
	Tin	0.35 mg/Kg	0.41U mg/Kg
	Tungsten	0.39 mg/Kg	1.0U mg/Kg
	Zirconium	12.1 mg/Kg	20.7U mg/Kg
	Mercury	23.8 ug/Kg	34.4U ug/Kg
TSB-FJ-02-10'**	Boron	6.1 mg/Kg	21.7U mg/Kg
	Cadmium	0.072 mg/Kg	0.11U mg/Kg
	Molybdenum	0.51 mg/Kg	1.1U mg/Kg
	Niobium	1.7 mg/Kg	5.4U mg/Kg
	Thallium	0.16 mg/Kg	0.44U mg/Kg
	Tungsten	0.29 mg/Kg	1.1U mg/Kg
	Zirconium	21.5 mg/Kg	21.7U mg/Kg
	Mercury	10.0 ug/Kg	36.2U ug/Kg
TSB-FR-02-0'**	Boron	4.0 mg/Kg	20.5U mg/Kg
	Cadmium	0.081 mg/Kg	0.10U mg/Kg
	Molybdenum	0.51 mg/Kg	1.0U mg/Kg
	Thallium	0.18 mg/Kg	0.41U mg/Kg
	Tungsten	0.37 mg/Kg	1.0U mg/Kg
	Zirconium	20.3 mg/Kg	20.5U mg/Kg
TSB-FR-02-10'**	Boron	7.5 mg/Kg	22.0U mg/Kg
	Cadmium	0.099 mg/Kg	0.11U mg/Kg
	Molybdenum	0.50 mg/Kg	1.1U mg/Kg
	Niobium	1.9 mg/Kg	5.5U mg/Kg
	Thallium	0.43 mg/Kg	0.44U mg/Kg
	Tungsten	0.66 mg/Kg	1.1U mg/Kg
	Mercury	12.5 ug/Kg	36.7U ug/Kg
TSB-FJ-09-0'**	Boron	9.3 mg/Kg	21.3U mg/Kg
	Molybdenum	0.76 mg/Kg	1.1U mg/Kg
	Thallium	0.27 mg/Kg	0.43U mg/Kg
	Tungsten	0.47 mg/Kg	1.1U mg/Kg
	Mercury	8.3 ug/Kg	35.5U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-09-10'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	8.1 mg/Kg 0.073 mg/Kg 0.42 mg/Kg 0.22 mg/Kg 0.32 mg/Kg 9.6 ug/Kg	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.1U ug/Kg
TSB-FR-03-0'**	Boron Cadmium Molybdenum Thallium Tin Tungsten Zirconium Mercury	9.7 mg/Kg 0.066 mg/Kg 0.37 mg/Kg 0.17 mg/Kg 0.36 mg/Kg 0.29 mg/Kg 16.0 mg/Kg 23.0 ug/Kg	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 20.2U mg/Kg 33.6U ug/Kg
TSB-FR-03-10'**	Boron Cadmium Molybdenum Thallium Tungsten	8.4 mg/Kg 0.068 mg/Kg 0.40 mg/Kg 0.17 mg/Kg 0.28 mg/Kg	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg

Sample RINSATE-3 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-3	11/15/07	Boron Calcium Iron Magnesium Molybdenum Niobium Sodium Strontium Thallium Tin Tungsten	25.0 ug/L 51.9 ug/L 12.8 ug/L 4.7 ug/L 0.43 ug/L 19.7 ug/L 98.9 ug/L 0.32 ug/L 1.5 ug/L 0.49 ug/L 0.26 ug/L	All soil samples in SDG TRNC-D-5

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-FJ-03-0'**	Boron Molybdenum Thallium Tungsten	10.0 mg/Kg 0.47 mg/Kg 0.19 mg/Kg 0.81 mg/Kg	20.9U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-03-0'-FD**	Boron Molybdenum Niobium Thallium Tungsten	8.1 mg/Kg 0.37 mg/Kg 4.3 mg/Kg 0.21 mg/Kg 0.39 mg/Kg	21.3U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-03-10'**	Boron Molybdenum Niobium Thallium Tungsten	5.5 mg/Kg 0.62 mg/Kg 2.5 mg/Kg 0.16 mg/Kg 0.41 mg/Kg	21.6U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-10-0'**	Boron Molybdenum Thallium Tungsten	9.7 mg/Kg 0.97 mg/Kg 0.34 mg/Kg 0.53 mg/Kg	21.4U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-10-10'**	Boron Molybdenum Thallium Tungsten	11.9 mg/Kg 0.67 mg/Kg 0.16 mg/Kg 0.29 mg/Kg	20.9U mg/Kg 1.00U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-FJ-04-0'**	Boron Molybdenum Thallium Tungsten	5.5 mg/Kg 0.46 mg/Kg 0.21 mg/Kg 0.36 mg/Kg	21.0U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-FJ-04-10'**	Boron Molybdenum Thallium Tungsten	7.8 mg/Kg 0.37 mg/Kg 0.16 mg/Kg 0.22 mg/Kg	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-02-0'**	Boron Molybdenum Thallium Tungsten	4.6 mg/Kg 0.51 mg/Kg 0.20 mg/Kg 0.28 mg/Kg	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-02-0'-FD**	Molybdenum Tin Tungsten	0.37 mg/Kg 0.35 mg/Kg 0.39 mg/Kg	1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-FJ-02-10'**	Boron Molybdenum Niobium Thallium Tungsten	6.1 mg/Kg 0.51 mg/Kg 1.7 mg/Kg 0.16 mg/Kg 0.29 mg/Kg	21.7U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-FR-02-0'**	Boron Molybdenum Thallium Tungsten	4.0 mg/Kg 0.51 mg/Kg 0.18 mg/Kg 0.37 mg/Kg	20.5U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FR-02-10'**	Boron Molybdenum Niobium Thallium Tungsten	7.5 mg/Kg 0.50 mg/Kg 1.9 mg/Kg 0.43 mg/Kg 0.66 mg/Kg	22.0U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-FJ-09-0'**	Boron Molybdenum Thallium Tungsten	9.3 mg/Kg 0.76 mg/Kg 0.27 mg/Kg 0.47 mg/Kg	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-09-10'**	Boron Molybdenum Thallium Tungsten	8.1 mg/Kg 0.42 mg/Kg 0.22 mg/Kg 0.32 mg/Kg	21.7U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FR-03-0'**	Boron Molybdenum Thallium Tin Tungsten	9.7 mg/Kg 0.37 mg/Kg 0.17 mg/Kg 0.36 mg/Kg 0.29 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-FR-03-10'**	Boron Molybdenum Thallium Tungsten	8.4 mg/Kg 0.40 mg/Kg 0.17 mg/Kg 0.28 mg/Kg	21.8U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U 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-FR-02-0'MS/MSD (All soil samples in SDG TRNC-D-5)	Antimony Phosphorus Tungsten Zinc Vanadium Zirconium	46.1 (75-125) 54.2 (75-125) 69.8 (75-125) 74.2 (75-125) - -	46.9 (75-125) 66.3 (75-125) 68.1 (75-125) 71.5 (75-125) 51.9 (75-125) 72.2 (75-125)	- - - - - -	J- (all detects) UJ (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-FR-02-0'MS/MSD (All soil samples in SDG TRNC-D-5)	Niobium Silicon Strontium	186.1 (75-125) 349.2 (75-125) 264.9 (75-125)	189.9 (75-125) 126.6 (75-125) 140.7 (75-125)	- - -	J+ (all detects) J+ (all detects) J+ (all detects)	A

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	119.6 (85-115)	All water samples in SDG TRNC-D-5	J+ (all detects)	P

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which a EPA 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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-FR-02-0'L**	Aluminum Cobalt Iron Magnesium Manganese Phosphorus Strontium Vanadium	10.8 (≤10) 10.9 (≤10) 15.6 (≤10) 12.7 (≤10) 16.6 (≤10) 13.1 (≤10) 18.0 (≤10) 14.3 (≤10)	All soil samples in SDG TRNC-D-5	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

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

XIII. Field Duplicates

Samples TSB-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Aluminum	6420	6130	5 (≤50)	-	-	-
Antimony	0.15	0.14	-	0.01 (≤1.1)	-	-
Arsenic	2.7	2.4	-	0.3 (≤2.1)	-	-
Barium	125	118	6 (≤50)	-	-	-
Beryllium	0.47	0.45	-	0.02 (≤0.21)	-	-
Boron	10.0	8.1	-	1.9 (≤21.3)	-	-
Cadmium	0.073	0.10	-	0.027 (≤0.11)	-	-
Calcium	16700	17100	2 (≤50)	-	-	-
Chromium	9.2	7.5	-	1.7 (≤2.1)	-	-
Cobalt	6.6	5.8	13 (≤50)	-	-	-
Copper	11.9	13.0	9 (≤50)	-	-	-
Iron	11000	9610	13 (≤50)	-	-	-
Lead	7.1	19.4	93 (≤50)	-	J (all detects)	A

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Magnesium	8250	7300	12 (≤50)	-	-	-
Manganese	261	252	4 (≤50)	-	-	-
Molybdenum	0.47	0.37	-	0.1 (≤1.1)	-	-
Nickel	15.3	11.3	30 (≤50)		-	-
Niobium	9.0	4.3	-	4.7 (≤5.3)	-	-
Palladium	0.24	0.25	-	0.01 (≤0.21)	-	-
Phosphorus	1040	1270	20 (≤50)	-	-	-
Potassium	1330	1790	29 (≤50)	-	-	-
Silicon	190	240	23 (≤50)	-	-	-
Silver	0.065	0.10	-	0.035 (≤0.43)	-	-
Sodium	465	948	68 (≤50)	-	J (all detects)	A
Strontium	156	154	1 (≤50)	-	-	-
Thallium	0.19	0.21	-	0.02 (≤0.43)	-	-
Tin	0.56	0.50	-	0.06 (≤0.43)	-	-
Titanium	429	435	1 (≤50)	-	-	-
Tungsten	0.81	0.39	-	0.42 (≤1.1)	-	-
Uranium	1.1	0.84	27 (≤50)	-	-	-
Vanadium	34.8	35.7	3 (≤50)	-	-	-
Zinc	27.6	30.2	9	-	-	-
Zirconium	17.3	17.0	-	0.3 (≤21.3)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Lithium	11.7	10.6	-	1.1 (≤10.6)	-	-
Sulfur	441U	674	-	233 (≤1060)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Mercury	15.7	16.7	-	1 (≤35.4)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
Aluminum	8540	4650	59 (≤50)	-	J (all detects)	A
Antimony	0.29	0.14	-	0.15 (≤1.1)	-	-
Arsenic	11.3	3.5	-	7.8 (≤2.1)	J (all detects)	A
Barium	138	83.4	49 (≤50)	-	-	-
Beryllium	0.63	0.39	-	0.24 (≤0.21)	J (all detects)	A
Boron	4.6	2.9U	-	1.7 (≤21.3)	-	-
Cadmium	0.10	0.055	-	0.045 (≤0.11)	-	-
Calcium	12200	30000	84 (≤50)	-	J (all detects)	A
Chromium	10.3	5.2	-	5.1 (≤2.1)	J (all detects)	A
Cobalt	5.9	4.7	23 (≤50)	-	-	-
Copper	14.5	11.0	27 (≤50)	-	-	-
Iron	12400	8620	36 (≤50)	-	-	-
Lead	8.9	5.7	44 (≤50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
Magnesium	6920	5910	16 (≤50)	-	-	-
Manganese	330	259	24 (≤50)	-	-	-
Molybdenum	0.51	0.37	-	0.14 (≤1.1)	-	-
Nickel	12.7	8.1	44 (≤50)	-	-	-
Palladium	0.21	0.17	-	0.04 (≤0.21)	-	-
Phosphorus	680	751	10 (≤50)	-	-	-
Potassium	2900	1240	80 (≤50)	-	J (all detects)	A
Silicon	158	129	20 (≤50)	-	-	-
Silver	0.081	0.052	-	0.029 (≤0.43)	-	-
Sodium	2910	1100	90 (≤50)	-	J (all detects)	A
Strontium	140	117	18 (≤50)	-	-	-
Thallium	0.20	0.14U	-	0.06 (≤0.43)	-	-
Tin	0.51	0.35	-	0.16 (≤0.43)	-	-
Titanium	439	343	25 (≤50)	-	-	-
Tungsten	0.28	0.39	-	0.11 (≤1.1)	-	-
Uranium	0.84	0.58	37 (≤50)	-	-	-
Vanadium	36.0	28.6	23 (≤50)	-	-	-
Zinc	32.0	27.2	16 (≤50)	-	-	-
Zirconium	18.6	12.1	-	6.5 (≤21.3)	-	-
Lithium	8.6	5.7	-	2.9 (≤10.7)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
Mercury	10.1	23.8	-	13.7 (≤35.5)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**	Antimony Phosphorus Tungsten Zinc Vanadium Zirconium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**	Niobium Silicon Strontium	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	RINSATE-3	Niobium	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**	Aluminum Cobalt Iron Magnesium Manganese Phosphorus Strontium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	ICP serial dilution (%D)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD**	Lead Sodium	J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	Arsenic Beryllium Chromium	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	Aluminum Calcium Potassium Sodium	J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	RINSATE-3	Niobium Tungsten	25.0U ug/L 5.0U ug/L	A
TRNC-D-5	TSB-FJ-03-0'**	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	20.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 20.9U mg/Kg 34.9U ug/Kg	A
TRNC-D-5	TSB-FJ-03-0'-FD**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.4U ug/Kg	A
TRNC-D-5	TSB-FJ-03-10'**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.6U mg/Kg 35.9U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-10-0'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.6U ug/Kg	A
TRNC-D-5	TSB-FJ-10-10'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-5	TSB-FJ-04-0'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	21.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.0U ug/Kg	A
TRNC-D-5	TSB-FJ-04-10'**	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.5U mg/Kg 35.8U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'**	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.5U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Cadmium Molybdenum Tin Tungsten Zirconium Mercury	0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 20.7U mg/Kg 34.4U ug/Kg	A
TRNC-D-5	TSB-FJ-02-10'**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 21.7U mg/Kg 36.2U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FR-02-0'**	Boron Cadmium Molybdenum Thallium Tungsten Zirconium	20.5U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 20.5U mg/Kg	A
TRNC-D-5	TSB-FR-02-10'**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Mercury	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg	A
TRNC-D-5	TSB-FJ-09-0'**	Boron Molybdenum Thallium Tungsten Mercury	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg	A
TRNC-D-5	TSB-FJ-09-10'**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.1U ug/Kg	A
TRNC-D-5	TSB-FR-03-0'**	Boron Cadmium Molybdenum Thallium Tin Tungsten Zirconium Mercury	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 20.2U mg/Kg 33.6U ug/Kg	A
TRNC-D-5	TSB-FR-03-10'**	Boron Cadmium Molybdenum Thallium Tungsten	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A

BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-03-0'**	Boron Molybdenum Thallium Tungsten	20.9U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-03-0'-FD**	Boron Molybdenum Niobium Thallium Tungsten	21.3U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-03-10'**	Boron Molybdenum Niobium Thallium Tungsten	21.6U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-10-0'**	Boron Molybdenum Thallium Tungsten	21.4U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-10-10'**	Boron Molybdenum Thallium Tungsten	20.9U mg/Kg 1.00U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-5	TSB-FJ-04-0'**	Boron Molybdenum Thallium Tungsten	21.0U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-04-10'**	Boron Molybdenum Thallium Tungsten	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'**	Boron Molybdenum Thallium Tungsten	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Molybdenum Tin Tungsten	1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-5	TSB-FJ-02-10'**	Boron Molybdenum Niobium Thallium Tungsten	21.7U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FR-02-0'**	Boron Molybdenum Thallium Tungsten	20.5U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FR-02-10'**	Boron Molybdenum Niobium Thallium Tungsten	22.0U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-09-0'**	Boron Molybdenum Thallium Tungsten	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-09-10'**	Boron Molybdenum Thallium Tungsten	21.7U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FR-03-0'**	Boron Molybdenum Thallium Tin Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-5	TSB-FR-03-10'**	Boron Molybdenum Thallium Tungsten	21.8U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A

LDC #: 18100E4
SDG #: TRNC-D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/18/08
Page: 1 of 1
Reviewer: c
2nd Reviewer: g

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

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	A	Sampling dates: 11/15/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	gMS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	LCS
VIII.	Internal Standard (ICP-MS)	SW	Not reviewed for Level 3
IX.	Furnace Atomic Absorption QC	N	Not Utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(1,2) (8,9)
XIV.	Field Blanks	SW	R = 17

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
All Soil except #17 FB

1	TSB-FJ-03-0'**	11	TSB-FR-02-0'**	21		31	
2	TSB-FJ-03-0'-FD**	12	TSB-FR-02-10'**	22		32	
3	TSB-FJ-03-10'**	13	TSB-FJ-09-0'**	23		33	
4	TSB-FJ-10-0'**	14	TSB-FJ-09-10'**	24		34	
5	TSB-FJ-10-10'**	15	TSB-FR-03-0'**	25		35	
6	TSB-FJ-04-0'**	16	TSB-FR-03-10'**	26		36	
7	TSB-FJ-04-10'**	17	RINSATE-3	27		37	
8	TSB-FJ-02-0'**	18	TSB-FR-02-0'MS	28		38	
9	TSB-FJ-02-0'-FD**	19	TSB-FR-02-0'MSD	29		39	
10	TSB-FJ-02-10'**	20	RB	30		40	

Notes:

LDC #: 181024
SDG #: JRM29-5

VALIDATION FINDINGS CHECKLIST

Reviewer: MH
2nd Reviewer:

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

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. 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)	✓			
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. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
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.		✓		
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				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analysies have duplicate injections? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	

LDC #: 181024
SDG #: TRNC-5

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			750X MDL for Zn/Mg
Were all percent differences (%Ds) < 10%?		✓		
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
VIII. Internal Standards (EPA SW 846 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?		✓		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

LDC #: 18100Z4
SDG #: TRNC-D-5

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-17	Soil/aq	[✓ 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,
m18, 19	Soil	[✓ 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, 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,
1-17	Soil/aq	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,]
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
m18, 19	Soil	[✓ 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,
		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, S,]
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,]
GFAA		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, CN,

Comments: [✓ Mercury by CVAA if performed]
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18100E4
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:
Associated Samples: All AQ

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	17									
Cd			0.0275											
Nb			9.0		19.7 / 25.0									
W			0.8		2.6 / 5.0									

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 #: 18100E4
SDG #: TRNC-D-5
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All

				Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10
Ba	0.13												
B	1.5	12.8		10.0 / 20.9	8.1 / 21.3	5.5 / 21.6	9.7 / 21.4	11.9 / 20.9	5.5 / 21.0	7.8 / 21.5	4.6 / 21.3		6.1 / 21.7
Cd		0.045		0.073 / 0.11	0.10 / 0.11	0.075 / 0.11	0.092 / 0.11	0.071 / 0.10	0.080 / 0.11	0.038 / 0.11	0.10 / 0.11	0.055 / 0.10	0.072 / 0.11
Fe	3.0												
Mo	0.058			0.47 / 1.1	0.37 / 1.1	0.62 / 1.1	0.97 / 1.1	0.67 / 1.0	0.46 / 1.1	0.37 / 1.1	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1
Ni		0.5											
Nb		9.2			4.3 / 5.3	2.5 / 5.4							1.7 / 5.4
P	1.3												
Na	4.3												
Tl		0.7		0.19 / 0.42	0.21 / 0.43	0.16 / 0.43	0.34 / 0.43	0.16 / 0.42	0.21 / 0.42	0.16 / 0.43	0.20 / 0.43		0.16 / 0.44
Sn	0.032	0.2										0.35 / 0.41	
Ti													
W		1.3		0.81 / 1.1	0.39 / 1.1	0.41 / 1.1	0.53 / 1.1	0.29 / 1.0	0.36 / 1.1	0.22 / 1.1	0.28 / 1.1	0.39 / 1.0	0.29 / 1.1
V	0.27	1.9											
Zn	1.0												
Zr	0.31			17.3 / 20.9	17.0 / 21.3	19.1 / 21.6				18.8 / 21.5	18.6 / 21.3	12.1 / 20.7	21.5 / 21.7
Hg (ug/Kg)		0.1		15.7 / 34.9	16.7 / 35.4	14.2 / 35.9	17.3 / 35.6	11.5 / 34.8	13.8 / 35.0	9.8 / 35.8	10.1 / 35.5	23.8 / 34.4	10.0 / 36.2

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 #: 18100E4
SDG #: TRNC-D-5
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All

				Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	11	12	13	14	15	16				
Ba	0.13												
B	1.5	12.8		4.0 / 20.5	7.5 / 22.0	9.3 / 21.3	8.1 / 21.7	9.7 / 20.2	8.4 / 21.8				
Cd		0.045		0.081 / 0.10	0.099 / 0.11		0.073 / 0.11	0.066 / 0.10	0.068 / 0.11				
Fe	3.0												
Mo	0.058			0.51 / 1.0	0.50 / 1.1	0.76 / 1.1	0.42 / 1.1	0.37 / 1.0	0.40 / 1.1				
Ni		0.5											
Nb		9.2			1.9 / 5.5								
P	1.3												
Na	4.3												
Tl		0.7		0.18 / 0.41	0.43 / 0.44	0.27 / 0.43	0.22 / 0.43	0.17 / 0.40	0.17 / 0.44				
Sn	0.032	0.2						0.36 / 0.40					
Ti													
W		1.3		0.37 / 1.0	0.66 / 1.1	0.47 / 1.1	0.32 / 1.1	0.29 / 1.0	0.28 / 1.1				
V	0.27	1.9											
Zn	1.0												
Zr	0.31			20.3 / 20.5				16.0 / 20.2					
Hg (ug/Kg)		0.1			12.5 / 36.7	8.3 / 35.5	9.6 / 36.1	23.0 / 33.6					

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 #: 18100E4
SDG #: TRNC-D-5

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /15 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	17	Action Level	1	2	3	4	5	6	7	8	9	10
B	25.0		10.0 / 20.9	8.1 / 21.3	5.5 / 21.6	9.7 / 21.4	11.9 / 20.9	5.5 / 21.0	7.8 / 21.5	4.6 / 21.3		6.1 / 21.7
Ca	51.9											
Fe	12.8											
Mg	4.7											
Mo	0.43		0.47 / 1.1	0.37 / 1.1	0.62 / 1.1	0.97 / 1.1	0.67 / 1.0	0.46 / 1.1	0.37 / 1.1	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1
Nb	19.7			4.3 / 5.3	2.5 / 5.4							1.7 / 5.4
Na	98.9	197.8										
Sr	0.32											
Tl	1.5		0.19 / 0.42	0.21 / 0.43	0.16 / 0.43	0.34 / 0.43	0.16 / 0.42	0.21 / 0.42	0.16 / 0.43	0.20 / 0.43		0.16 / 0.44
Sn	0.49										0.35 / 0.41	
W	0.26		0.81 / 1.1	0.39 / 1.1	0.41 / 1.1	0.53 / 1.1	0.29 / 1.0	0.36 / 1.1	0.22 / 1.1	0.28 / 1.1	0.39 / 1.0	0.29 / 1.1

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".

LDC #: 18100E4
SDG #: TRNC-D-5

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

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

N N/A Were field blanks identified in this SDG?
N N/A Were target analytes detected in the field blanks?

Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /15 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	17	Action Level	11	12	13	14	15	16				
B	25.0		4.0 / 20.5	7.5 / 22.0	9.3 / 21.3	8.1 / 21.7	9.7 / 20.2	8.4 / 21.8				
Ca	51.9											
Fe	12.8											
Mg	4.7											
Mo	0.43		0.51 / 1.0	0.50 / 1.1	0.76 / 1.1	0.42 / 1.1	0.37 / 1.0	0.40 / 1.1				
Nb	19.7			1.9 / 5.5								
Na	98.9	197.8										
Sr	0.32											
Tl	1.5		0.18 / 0.41	0.43 / 0.44	0.27 / 0.43	0.22 / 0.43	0.17 / 0.40	0.17 / 0.44				
Sn	0.49						0.36 / 0.40					
W	0.26		0.37 / 1.0	0.66 / 1.1	0.47 / 1.1	0.32 / 1.1	0.29 / 1.0	0.28 / 1.1				

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".

LDC #: 181-024
SDG #: TRNC-1-5

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MH
2nd Reviewer: [illegible]

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 a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	RINSATE-2	AQ	Li			25.7 (≤20)	All AQ	No qual (MS/MSD LCS in)
			S			24.6 ↓	↓	↓
2	18/19	Soil	Sb	46.1	46.9		All Soil	J-/UJ/A
			Nb	186.1	189.9			J+ UJ/A
			P	54.2	66.3			J-/UJ/A
			Si	349.2	126.6			J+ UJ/A
			Sr	264.9	140.7			↓
			W	69.8	68.1			J-/UJ/A
			Zn	74.2	71.5			
			V		51.9			
			Zr		72.2			↓
			Mn			31.5 (≤20)	↓	No qual (LCS/LR)
			Si			56.9 ↓		↓
			Sr			23.7 ↓		

Comments: _____

LDC #: 18100Z4
SDG #: TRMC-2-5

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MH
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".

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	A2	Nb	119.6 (85-115)	All A2	J+ UJ / P

Comments:

LDC #: 18007 4
SDG #: TRNC-DX

VALIDATION FINDINGS WORKSHEET
Internal Standards (ICP-MS)

Page: 1 of 1
Reviewer: HH
2nd Reviewer: Q

METHOD: Metals (EPA SW 846 Method 6020)

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

Y (N) N/A Were all internal standard percent recoveries within 30-120% of the intensity of the internal standard in the initial calibration standard ?

Y (N) N/A If the response to either of the above questions is no, were the samples reanalyzed as required ?

#	Internal Standard	Associated Metals	%R (Limits)	Associated Samples	Qualifications
1	Sc 45	V	120.69	18	No qual (MS)

INTST.4S2

LDC #: 18100Z4
SDG #: FRNC-D-5

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

(Y) N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1		11	Soil	Al	10.8	All Soil	J UJ/A
				Co	10.9		
				Fe	15.6		
				Mg	12.7		
				Mn	16.6		
				P	13.1		
				Sr	18.0		
				V	14.3		

Comments: Cu, Ni <1.00X 1492

SDILICPMS.wpd

LDC#: 18100E4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 1	Concentration (mg/kg) 2	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	6420	6130	5			
Antimony	0.15	0.14		0.01	(≤1.1)	
Arsenic	2.7	2.4		0.3	(≤2.1)	
Barium	125	118	6			
Beryllium	0.47	0.45		0.02	(≤0.21)	
Boron	10.0	8.1		1.9	(≤21.3)	
Cadmium	0.073	0.10		0.027	(≤0.11)	
Calcium	16700	17100	2			
Chromium	9.2	7.5		1.7	(≤2.1)	
Cobalt	6.6	5.8	13			
Copper	11.9	13.0	9			
Iron	11000	9610	13			
Lead	7.1	19.4	93			J det / A
Magnesium	8250	7300	12			
Manganese	261	252	4			
Molybdenum	0.47	0.37		0.1	(≤1.1)	
Nickel	15.3	11.3	30			
Niobium	9.0	4.3		4.7	(≤5.3)	
Palladium	0.24	0.25		0.01	(≤0.21)	

LDC#: 18100E4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 1	Concentration (mg/kg) 2	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Phosphorus	1040	1270	20			
Potassium	1330	1790	29			
Silicon	190	240	23			
Silver	0.065	0.10		0.035	(≤0.43)	
Sodium	465	948	68			J det / A
Strontium	156	154	1			
Thallium	0.19	0.21		0.02	(≤0.43)	
Tin	0.56	0.50		0.06	(≤0.43)	
Titanium	429	435	1			
Tungsten	0.81	0.39		0.42	(≤1.1)	
Uranium	1.1	0.84	27			
Vanadium	34.8	35.7	3			
Zinc	27.6	30.2	9			
Zirconium	17.3	17.0		0.3	(≤21.3)	
Lithium	11.7	10.6		1.1	(≤10.6)	
Sulfur	441U	674		233	(≤1060)	
Mercury (ug/Kg)	15.7	16.7		1	(≤35.4)	

LDC#: 18100E4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Compound	Concentration (mg/kg) 8	Concentration (mg/kg) 9	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	8540	4650	59			J det / A
Antimony	0.29	0.14		0.15	(≤1.1)	
Arsenic	11.3	3.5		7.8	(≤2.1)	J det / A
Barium	138	83.4	49			
Beryllium	0.63	0.39		0.24	(≤0.21)	J det / A
Boron	4.6	2.9U		1.7	(≤21.3)	
Cadmium	0.10	0.055		0.045	(≤0.11)	
Calcium	12200	30000	84			J det / A
Chromium	10.3	5.2		5.1	(≤2.1)	J det / A
Cobalt	5.9	4.7	23			
Copper	14.5	11.0	27			
Iron	12400	8620	36			
Lead	8.9	5.7	44			
Magnesium	6920	5910	16			
Manganese	330	259	24			
Molybdenum	0.51	0.37		0.14	(≤1.1)	
Nickel	12.7	8.1	44			
Palladium	0.21	0.17		0.04	(≤0.21)	
Phosphorus	680	751	10			

LDC#: 18100E4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 8	Concentration (mg/kg) 9	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Potassium	2900	1240	80			J det / A
Silicon	158	129	20			
Silver	0.081	0.052		0.029	(≤0.43)	
Sodium	2910	1100	90			J det / A
Strontium	140	117	18			
Thallium	0.20	0.14U		0.06	(≤0.43)	
Tin	0.51	0.35		0.16	(≤0.43)	
Titanium	439	343	25			
Tungsten	0.28	0.39		0.11	(≤1.1)	
Uranium	0.84	0.58	37			
Vanadium	36.0	28.6	23			
Zinc	32.0	27.2	16			
Zirconium	18.6	12.1		6.5	(≤21.3)	
Lithium	8.6	5.7		2.9	(≤10.7)	
Mercury (ug/Kg)	10.1	23.8		13.7	(≤35.5)	

LDC #: 18100B4
SDG #: TRNC0-5

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MM
2nd Reviewer: [illegible]

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

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	Li	4065.8	4000	101.6	101.6	Y
	GFAA (Initial calibration)						
ICV	CVAA (Initial calibration)	Hg	2.44	2.5	97.6	97.6	Y
CCV	ICP (Continuing calibration)	S	4161.0	4000	104.0	104.0	Y
	GFAA (Continuing calibration)						
CCV	CVAA (Continuing calibration)	Hg	4.90	5.0	98.0	98.0	Y
ICV	ICP/MS (Initial calibration)	K	2017.4	2000	100.9	100.9	Y
CCV	ICP/MS (Continuing calibation)	Zr	~~203.63~~ 203.63	200	101.8	101.8	Y

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 #: 18/6024
SDG #: TRHC-5

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

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:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

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

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Ni	95.465	100	95.5	95.5	Y
LCS	Laboratory control sample	Se	66.0	64.2	102.9	102.9	
18	Matrix spike	Li	(SSR-SR) 110.3	102.48	107.6	107.6	
18/9	Duplicate	Cd	2.636	2.762	4.7	4.7	
11 8	ICP serial dilution	Ba	461	453.6	1.6	1.6	✓

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 #: 18100b4
SDG #: TRNC-005

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: MM
2nd reviewer: [illegible]

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 Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 1, 11 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

#1

$$Be = \frac{1.1254\ ug/L \times 0.1\ L \times 2}{0.5\ g \times 0.9565} = 20.4706\ ug/kg$$

Sample ID	Analyte	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
	Li	11.7	11.6	Y
	Al	6420	6420	
	Sb	0.15	0.15	
	As	2.7	2.7	
	Ba	125	124	
	Be	0.47	0.47	
	B	10.0	10.0	
	Cd	0.073	0.073	
	Ca	16700	16700	
	Cr	9.2	9.2	
	Co	6.6	6.6	
	Cu	11.9	11.9	
	Fe	11000	11000	
	Pb	7.1	7.1	
	Mg	8250	8250	
	Mn	261	261	
	Mo	0.47	0.47	
	Ni	15.3	15.3	
	Nb	9.0	9.0	
	Pd	0.24	0.24	
	P	1040	1040	
	K	1330	1330	✓

LDC #: 18100Z4
SDG #: TRM6-1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 3
Reviewer: MH
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".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 1, 11 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

#1, Hg = $\frac{0.090\ ug/L \times 100\ mL}{0.6\ g \times 0.1565}$ = 15.68 ug/kg

Sample ID	Analyte	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
1	Si	190	190	Y
	Ag	0.065	0.065	
	Na	465	466.4	
	Sr	156	156	
	Tl	0.19	0.19	
	Sn	0.56	0.56	
	Ti	4.29	4.29	
	W	0.81	0.81	
	U	1.1	1.1	
	V	34.8	34.8	
	Zn	27.6	27.6	
	Zr	17.3	17.3	
	Hg (ug/kg)	15.7	15.7	✓
11	Li	10.0	10.0	Y
	Al	6900	6900	
	Sb	0.22	0.22	
	As	3.6	3.6	
	Ba	186	186	
	Be	0.55	0.55	
	B	4.0	4.0	
	Cd	0.081	0.081	✓

LDC #: 18|0024
SDG #: TRNC-D-5

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: MH
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".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 11 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

#11

$$Mn = \frac{876.8939\ ug/L \times 0.1\ L \times 2}{0.5\ g \times 0.9958} = 343.0\ mg/kg$$

Sample ID	Analyte	Reported Concentration (ug/g)	Calculated Concentration (ug/g)	Acceptable (Y/N)
11	Ca	21200	21205	Y
	Cr	10.0	10.0	
	Co	6.5	6.5	
	Cu	13.2	13.2	
	Fe	12700	12700	
	Pb	10.6	10.6	
	Mg	7620	7620	
	Mn	343	343	
	Mo	0.51	0.56	
	Ni	13.0	13.0	
	Pd	0.26	0.26	
	P	905	905	
	K	1880	1880	
	Si	157	157	
	Ag	0.074	0.074	
	Na	812	812	
	Sr	164	164	
	Tl	0.18	0.18	
	Sn	0.56	0.56	
	Ti	499	499	
	W	0.37	0.37	
	U	0.88	0.88	
	V	43.9	43.9	
	Zn	30.6	30.6	
	Zr	20.3	20.3	
	Hg (ug/g)	35.5	35.5	

RECALC.4S2

LDC Report# 18100F4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 22, 2008

Matrix: Soil/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
RINSATE-4MS
RINSATE-4MSD

Introduction

This data review covers 17 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 a 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.

Raw data were not reviewed for this SDG. The review was 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

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
11/27/07	CCV (2314)	Boron	112.1 (90-110)	TSB-FJ-08-0' TSB-FJ-08-10' RINSATE-4 RINSATE-4MS RINSATE-4MSD PBW PBS	J+ (all detects)	P
11/27/07	CCV (2314)	Niobium	119.7 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P
11/28/07	CCV (0032)	Vanadium	111.9 (90-110)	RINSATE-4 RINSATE-4MS RINSATE-4MSD	J+ (all detects)	P
11/27/07	CCV (2156)	Boron Vanadium	111.5 (90-110) 113.1 (90-110)	PBW	J+ (all detects) J+ (all detects)	P
11/29/07	CCV (1900)	Niobium	118.2 (90-110)	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS PBS	J+ (all detects)	P

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)	Copper Manganese Nickel Tin	0.50 ug/L 0.62 ug/L 0.87 ug/L 0.35 ug/L	All water samples in SDG TRNC-D-6
ICB/CCB	Cadmium Copper Molybdenum Nickel Niobium Thallium Tungsten	0.045 ug/L 0.4 ug/L 0.2 ug/L 0.5 ug/L 14.9 ug/L 0.7 ug/L 1.3 ug/L	All water samples in SDG TRNC-D-6
PB (prep blank)	Aluminum Barium Boron Calcium Phosphorus Sodium Thallium Tin Titanium Tungsten Vanadium Zinc	2.0 mg/Kg 0.076 mg/Kg 3.6 mg/Kg 22.1 mg/Kg 1.2 mg/Kg 3.8 mg/Kg 0.17 mg/Kg 0.069 mg/Kg 0.029 mg/Kg 0.24 mg/Kg 0.19 mg/Kg 2.0 mg/Kg	All soil samples in SDG TRNC-D-6
ICB/CCB	Boron Cadmium Nickel Niobium Thallium Tin Tungsten Vanadium Lithium Mercury	12.8 ug/L 0.045 ug/L 0.5 ug/L 9.2 ug/L 0.7 ug/L 0.2 ug/L 1.3 ug/L 1.9 ug/L 15.0 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-6

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-4	Cadmium Copper Nickel Niobium Tin Tungsten	0.032 ug/L 0.63 ug/L 0.51 ug/L 8.8 ug/L 0.31 ug/L 0.66 ug/L	0.50U ug/L 1.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 5.0U ug/L
TSB-FJ-08-0'	Boron Niobium Thallium Mercury	8.6 mg/Kg 3.1 mg/Kg 0.28 mg/Kg 21.4 ug/Kg	21.2U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 35.4U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-08-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	8.4 mg/Kg 0.086 mg/Kg 1.8 mg/Kg 0.26 mg/Kg 0.69 mg/Kg 13.5 ug/Kg	22.2U mg/Kg 0.11U mg/Kg 5.6U mg/Kg 0.45U mg/Kg 1.1U mg/Kg 37.1U ug/Kg
TSB-FR-05-0'	Boron Cadmium Thallium Tungsten Mercury	5.2 mg/Kg 0.095 mg/Kg 0.25 mg/Kg 0.55 mg/Kg 28.6 ug/Kg	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg
TSB-FR-05-10'	Boron Cadmium Thallium Tungsten Mercury	9.0 mg/Kg 0.083 mg/Kg 0.21 mg/Kg 0.47 mg/Kg 10.7 ug/Kg	21.9U mg/Kg 0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.4U ug/Kg
TSB-FR-04-0'	Boron Thallium Tin Tungsten Lithium Mercury	3.7 mg/Kg 0.18 mg/Kg 0.40 mg/Kg 0.33 mg/Kg 7.8 mg/Kg 16.6 ug/Kg	20.8U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 10.4U mg/Kg 34.6U ug/Kg
TSB-FR-04-0'-FD	Boron Cadmium Thallium Tungsten Mercury	4.5 mg/Kg 0.075 mg/Kg 0.19 mg/Kg 0.36 mg/Kg 10.3 ug/Kg	21.6U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.0U ug/Kg
TSB-FR-04-10'	Boron Cadmium Thallium Tungsten Mercury	11.4 mg/Kg 0.083 mg/Kg 0.19 mg/Kg 0.40 mg/Kg 9.6 ug/Kg	21.7U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.2U ug/Kg
TSB-FJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	6.0 mg/Kg 0.098 mg/Kg 0.16 mg/Kg 0.31 mg/Kg 11.7 ug/Kg	20.6U mg/Kg 0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg
TSB-FJ-01-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	9.4 mg/Kg 0.088 mg/Kg 1.8 mg/Kg 0.40 mg/Kg 0.68 mg/Kg 11.4 ug/Kg	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg **1.1U mg/Kg** 35.6U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GR-01-0'	Boron Thallium Tungsten Mercury	8.5 mg/Kg 0.23 mg/Kg 0.51 mg/Kg 9.9 ug/Kg	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-GR-01-5'	Boron Thallium Tungsten Mercury	6.8 mg/Kg 0.20 mg/Kg 0.43 mg/Kg 14.6 ug/Kg	21.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.2U ug/Kg
TSB-GJ-06-0'	Boron Thallium Tungsten Mercury	7.9 mg/Kg 0.24 mg/Kg 0.53 mg/Kg 22.0 ug/Kg	21.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg
TSB-GJ-06-5'	Boron Cadmium Thallium Tungsten Mercury	8.1 mg/Kg 0.10 mg/Kg 0.17 mg/Kg 0.34 mg/Kg 8.6 ug/Kg	21.4U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg
TSB-GJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	8.1 mg/Kg 0.10 mg/Kg 0.18 mg/Kg 0.36 mg/Kg 24.2 ug/Kg	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg
TSB-GJ-01-5'	Boron Cadmium Thallium Tungsten Mercury	7.5 mg/Kg 0.088 mg/Kg 0.17 mg/Kg 0.36 mg/Kg 13.1 ug/Kg	21.5U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg

Sample "RINSATE-4" 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-4	11/16/07	Cadmium Calcium Copper Iron Magnesium Nickel Niobium Silicon Sodium Strontium Tin Tungsten	0.032 ug/L 73.4 ug/L 0.63 ug/L 17.9 ug/L 5.7 ug/L 0.51 ug/L 8.8 ug/L 85.3 ug/L 75.9 ug/L 0.42 ug/L 0.31 ug/L 0.66 ug/L	All soil samples in SDG TRNC-D-6

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-FJ-08-0'	Niobium	3.1 mg/Kg	5.3U mg/Kg
TSB-FJ-08-10'	Cadmium Niobium Tungsten	0.086 mg/Kg 1.8 mg/Kg 0.69 mg/Kg	0.11U mg/Kg 5.6U mg/Kg 1.1U mg/Kg
TSB-FR-05-0'	Cadmium Tungsten	0.095 mg/Kg 0.55 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FR-05-10'	Cadmium Tungsten	0.083 mg/Kg 0.47 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FR-04-0'	Tin Tungsten	0.40 mg/Kg 0.33 mg/Kg	0.42U mg/Kg 1.0U mg/Kg
TSB-FR-04-0'-FD	Cadmium Tungsten	0.075 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FR-04-10'	Cadmium Tungsten	0.083 mg/Kg 0.40 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FJ-01-0'	Cadmium Tungsten	0.098 mg/Kg 0.31 mg/Kg	0.10U mg/Kg 1.0U mg/Kg
TSB-FJ-01-10'	Cadmium Niobium Tungsten	0.088 mg/Kg 1.8 mg/Kg 0.68 mg/Kg	0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg
TSB-GR-01-0'	Tungsten	0.51 mg/Kg	1.0U mg/Kg
TSB-GR-01-5'	Tungsten	0.43 mg/Kg	1.1U mg/Kg
TSB-GJ-06-0'	Tungsten	0.53 mg/Kg	1.1U mg/Kg
TSB-GJ-06-5'	Cadmium Tungsten	0.10 mg/Kg 0.34 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-GJ-01-0'	Cadmium Tungsten	0.10 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-GJ-01-5'	Cadmium Tungsten	0.088 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U 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-FJ-01-0'MS/MSD (All soil samples in SDG TRNC-D-6)	Antimony Copper Magnesium Tungsten Zinc Zirconium	53.1 (75-125) 62.6 (75-125) 66.2 (75-125) 74.0 (75-125) 64.7 (75-125) -	55.1 (75-125) - - 74.0 (75-125) - 68.9 (75-125)	- - - - - -	J- (all detects) UJ (all non-detects)	A
TSB-FJ-01-0'MS/MSD (All soil samples in SDG TRNC-D-6)	Niobium Silicon Barium	170.9 (75-125) 200.1 (75-125) -	197.3 (75-125) 169.5 (75-125) 146.5 (75-125)	- - -	J+ (all detects) J+ (all detects) J+ (all detects)	A
TSB-FJ-01-0'MS/MSD (All soil samples in SDG TRNC-D-6)	Phosphorus	59.3 (75-125)	129.0 (75-125)	-	J (all detects) UJ (all non-detects)	A

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.

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in this SDG.

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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-FJ-01-0'L	Aluminum	12.0 (≤10)	All soil samples in SDG TRNC-D-6	J (all detects)	A
	Calcium	18.7 (≤10)		J (all detects)	
	Cobalt	11.7 (≤10)		J (all detects)	
	Iron	16.7 (≤10)		J (all detects)	
	Magnesium	12.8 (≤10)		J (all detects)	
	Manganese	18.6 (≤10)		J (all detects)	
	Phosphorus	14.3 (≤10)		J (all detects)	
	Potassium	10.2 (≤10)		J (all detects)	
	Strontium	20.4 (≤10)		J (all detects)	
	Titanium	10.9 (≤10)		J (all detects)	
	Vanadium	13.7 (≤10)		J (all detects)	

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Aluminum	5460 mg/Kg	7740 mg/Kg	35 (≤50)	-	-	-
Antimony	0.14 mg/Kg	0.20 mg/Kg	-	0.06 mg/Kg (≤1.1)	-	-
Arsenic	2.8 mg/Kg	4.2 mg/Kg	-	1.4 mg/Kg (≤2.2)	-	-
Barium	67.0 mg/Kg	122 mg/Kg	58 (≤50)	-	J (all detects)	A
Beryllium	0.45 mg/Kg	0.55 mg/Kg	-	0.01 mg/Kg (≤0.22)	-	-
Boron	3.7 mg/Kg	4.5 mg/Kg	-	0.8 mg/Kg (≤21.6)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Cadmium	0.11 mg/Kg	0.075 mg/Kg	-	0.035 mg/Kg (≤0.11)	-	-
Calcium	62400 mg/Kg	23200 mg/Kg	92 (≤50)	-	J (all detects)	A
Chromium	7.4 mg/Kg	12.4 mg/Kg	-	5 mg/Kg (≤2.2)	J (all detects)	A
Cobalt	5.3 mg/Kg	7.5 mg/Kg	34 (≤50)	-	-	-
Copper	10.4 mg/Kg	15.3 mg/Kg	38 (≤50)	-	-	-
Iron	9400 mg/Kg	14900 mg/Kg	45 (≤50)	-	-	-
Lead	5.1 mg/Kg	7.9 mg/Kg	43 (≤50)	-	-	-
Magnesium	7150 mg/Kg	8550 mg/Kg	18 (≤50)	-	-	-
Manganese	154 mg/Kg	262 mg/Kg	52 (≤50)	-	J (all detects)	A
Molybdenum	0.29 mg/Kg	0.50 mg/Kg	-	0.21 mg/Kg (≤1.1)	-	-
Nickel	13.0 mg/Kg	15.7 mg/Kg	19 (≤50)	-	-	-
Palladium	0.26 mg/Kg	0.31 mg/Kg	-	0.05 mg/Kg (≤0.22)	-	-
Phosphorus	922 mg/Kg	1090 mg/Kg	17 (≤50)	-	-	-
Potassium	1340 mg/Kg	1710 mg/Kg	24 (≤50)	-	-	-
Silicon	177 mg/Kg	121 mg/Kg	38 (≤50)	-	-	-
Silver	0.064 mg/Kg	0.085 mg/Kg	-	0.021 mg/Kg (≤0.43)	-	-
Sodium	261 mg/Kg	471 mg/Kg	57 (≤50)	-	J (all detects)	A
Strontium	170 mg/Kg	216 mg/Kg	24 (≤50)	-	-	-
Thallium	0.18 mg/Kg	0.19 mg/Kg	-	0.01 mg/Kg (≤0.43)	-	-
Tin	0.40 mg/Kg	0.55 mg/Kg	-	0.15 mg/Kg (≤0.43)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Titanium	356 mg/Kg	590 mg/Kg	49 (≤50)	-	-	-
Tungsten	0.33 mg/Kg	0.36 mg/Kg	-	0.03 mg/Kg (≤1.1)	-	-
Uranium	0.86 mg/Kg	1.2 mg/Kg	33 (≤50)	-	-	-
Vanadium	27.4 mg/Kg	51.7 mg/Kg	61 (≤50)	-	J (all detects)	A
Zinc	25.9 mg/Kg	31.7 mg/Kg	20 (≤50)	-	-	-
Zirconium	14.4 mg/Kg	21.7 mg/Kg	-	7.3 mg/Kg (≤21.6)	-	-
Lithium	7.8 mg/Kg	15.4 mg/Kg	-	7.6 mg/Kg (≤10.8)	-	-
Mercury	16.6 ug/Kg	10.3 ug/Kg	-	6.3 ug/Kg (≤36.0)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' RINSATE-4	Boron	J+ (all detects)	P	Calibration (%R)
TRNC-D-6	RINSATE-4	Niobium Vanadium	J+ (all detects) J+ (all detects)	P	Calibration (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'	Niobium	J+ (all detects)	P	Calibration (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Antimony Copper Magnesium Tungsten Zinc Zirconium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Niobium Silicon Barium	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Phosphorus	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Aluminum Calcium Cobalt Iron Magnesium Manganese Phosphorus Potassium Strontium Titanium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Barium Calcium Manganese Sodium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Chromium	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	RINSATE-4	Cadmium Copper Nickel Niobium Tin Tungsten	0.50U ug/L 1.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 5.0U ug/L	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FJ-08-0'	Boron Niobium Thallium Mercury	21.2U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 35.4U ug/Kg	A
TRNC-D-6	TSB-FJ-08-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	22.2U mg/Kg 0.11U mg/Kg 5.6U mg/Kg 0.45U mg/Kg 1.1U mg/Kg 37.1U ug/Kg	A
TRNC-D-6	TSB-FR-05-0'	Boron Cadmium Thallium Tungsten Mercury	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg	A
TRNC-D-6	TSB-FR-05-10'	Boron Cadmium Thallium Tungsten Mercury	21.9U mg/Kg 0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.4U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'	Boron Thallium Tin Tungsten Lithium Mercury	20.8U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 10.4U mg/Kg 34.6U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Boron Cadmium Thallium Tungsten Mercury	21.6U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.0U ug/Kg	A
TRNC-D-6	TSB-FR-04-10'	Boron Cadmium Thallium Tungsten Mercury	21.7U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.2U ug/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	20.6U mg/Kg 0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FJ-01-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg **1.1U mg/Kg** 35.6U ug/Kg	A
TRNC-D-6	TSB-GR-01-0'	Boron Thallium Tungsten Mercury	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-6	TSB-GR-01-5'	Boron Thallium Tungsten Mercury	21.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.2U ug/Kg	A
TRNC-D-6	TSB-GJ-06-0'	Boron Thallium Tungsten Mercury	21.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg	A
TRNC-D-6	TSB-GJ-06-5'	Boron Cadmium Thallium Tungsten Mercury	21.4U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg	A
TRNC-D-6	TSB-GJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg	A
TRNC-D-6	TSB-GJ-01-5'	Boron Cadmium Thallium Tungsten Mercury	21.5U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FJ-08-0'	Niobium	5.3U mg/Kg	A
TRNC-D-6	TSB-FJ-08-10'	Cadmium Niobium Tungsten	0.11U mg/Kg 5.6U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-05-0'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FR-05-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FR-04-0'	Tin Tungsten	0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FR-04-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Cadmium Tungsten	0.10U mg/Kg 1.0U mg/Kg	A
TRNC-D-6	TSB-FJ-01-10'	Cadmium Niobium Tungsten	0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-GR-01-0'	Tungsten	1.0U mg/Kg	A
TRNC-D-6	TSB-GR-01-5'	Tungsten	1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-06-0'	Tungsten	1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-06-5'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-01-0'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-01-5'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A

LDC #: 18100F4 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/17/08
SDG #: TRNC-D-6 Level III Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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	A	Sampling dates: 11/16/07
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3 MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(5, 6)
XIV.	Field Blanks	SW	R=16

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: All Soil except #16, 19, no Al.

1	TSB-FJ-08-0'	11	TSB-GR-01-5'	21	PB	31	
2	TSB-FJ-08-10'	12	TSB-GJ-06-0'	22		32	
3	TSB-FR-05-0'	13	TSB-GJ-06-5'	23		33	
4	TSB-FR-05-10'	14	TSB-GJ-01-0'	24		34	
5	TSB-FR-04-0'	15	TSB-GJ-01-5'	25		35	
6	TSB-FR-04-0'-FD	16	RINSATE-4 R	26		36	
7	TSB-FR-04-10'	17	TSB-FJ-01-0'MS	27		37	
8	TSB-FJ-01-0'	18	TSB-FJ-01-0'MSD	28		38	
9	TSB-FJ-01-10'	19	RINSATE-4MS R	29		39	
10	TSB-GR-01-0'	20	RINSATE-4MSD	30		40	

Notes: _____

LDC #: 18100T4
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-16	Soil/Aq	[✓ 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,
17,18	Soil	[✓ 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,]
19,20	Aq	[✓ 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, 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,
1-16	Soil/Aq	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,]
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
17,18	Soil	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,]
19,20	Aq	[✓ 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,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
Analysis Method		
ICP		[✓ Li, S,]
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,]
GFAA		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, CN:

Comments: [✓ Mercury by CVAA if performed]

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

LDC #: 18100F4
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: MM
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".

(Y) N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y (N) N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N (N/A) Was a midrange cyanide standard distilled?

Y N (N/A) Are all correlation coefficients ≥0.995?

Y N (N/A) 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
1	11/27/07	ccv (2314)	B	112.1	All Ar + 1,2, PBS	J+ UJ+ /P
			Nb	119.7	All MA only	J
2	11/28/07	ccv (0032)	V	111.9	16, 19, 20	J+ UJ+ /P
3	11/27/07	ccv (2156)	B	111.5	PBW	J+ UJ+ /P
			V	113.1	J	J
4	11/29/07	ccv (1902)	Nb	118.2	1-8, 17, PBS	J+ UJ+ /P

Comments:

LDC #: 18100F4
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:
Associated Samples: All AQ

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	16									
Cd			0.045		0.032 / 0.50									
Cu		0.50	0.4		0.63 / 1.0									
Mn		0.62												
Mo			0.2											
Ni		0.87	0.5		0.51 / 5.0									
Nb			14.9		8.8 / 25.0									
Tl			0.7											
Sn		0.35			0.31 / 2.0									
W			1.3		0.66 / 5.0									

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 #: 18100F4
SDG #: TRNC-D-6
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All Soil

				Sample Identification									
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum ICB/CCB[a] (ug/L)**	**Blank Action Limit**	1	2	3	4	5	6	7	8	9	10
Al	2.0												
Ba	0.076												
B	3.6	12.8		8.6 / 21.2	8.4 / 22.2	5.2 / 21.1	9.0 / 21.9	3.7 / 20.8	4.5 / 21.6	11.4 / 21.7	6.0 / 20.6	9.4 / 21.4	8.5 / 20.9
Cd		0.045			0.086 / 0.11	0.095 / 0.11	0.083 / 0.11		0.075 / 0.11	0.083 / 0.11	0.098 / 0.10	0.088 / 0.11	
Ca	22.1												
Ni		0.5											
Nb		9.2		3.1 / 5.3	1.8 / 5.6							1.8 / 5.3	
P	1.2												
Na	3.8												
Tl	0.17	0.7		0.28 / 0.43	0.26 / 0.45	0.25 / 0.42	0.21 / 0.44	0.18 / 0.42	0.19 / 0.43	0.19 / 0.43	0.16 / 0.41	0.40 / 0.43	0.23 / 0.42
Sn	0.069	0.2						0.40 / 0.42					
Ti	0.029												
W	0.24	1.3			0.69 / 1.1	0.55 / 1.1	0.47 / 1.1	0.33 / 1.0	0.36 / 1.1	0.40 / 1.1	0.31 / 1.0	0.68 / 1.1	0.51 / 1.0
V	0.19	1.9											
Zn	2.0												
Li		15.0						7.8 / 10.4					
Hg (ug/Kg)		0.1		21.4 / 35.4	13.5 / 37.1	28.6 / 35.1	10.7 / 36.4	16.6 / 34.6	10.3 / 36.0	9.6 / 36.2	11.7 / 34.3	11.4 / 35.6	9.9 / 34.8

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 #: 18100F4
SDG #: TRNC-D-6
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All Soil

Reviewer:
2nd Reviewer:

				Sample Identification									
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum ICB/CCB[a] (ug/L)**	**Blank Action Limit**	11	12	13	14	15					
Al	2.0												
Ba	0.076												
B	3.6	12.8		6.8 / 21.1	7.9 / 21.4	8.1 / 21.4	8.1 / 21.1	7.5 / 21.5					
Cd		0.045				0.10 / 0.11	0.10 / 0.11	0.088 / 0.11					
Ca	22.1												
Ni		0.5											
Nb		9.2											
P	1.2												
Na	3.8												
Tl	0.17	0.7		0.20 / 0.42	0.24 / 0.43	0.17 / 0.43	0.18 / 0.42	0.17 / 0.43					
Sn	0.069	0.2											
Ti	0.029												
W	0.24	1.3		0.43 / 1.1	0.53 / 1.1	0.34 / 1.1	0.36 / 1.1	0.36 / 1.1					
V	0.19	1.9											
Zn	2.0												
Li		15.0											
Hg (ug/Kg)		0.1		14.6 / 35.2	22.0 / 35.7	8.6 / 35.7	24.2 / 35.1	13.1 / 35.8					

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 #: 18100F4
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

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

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /16 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	16	Action Level	1	2	3	4	5	6	7	8	9	10
Cd	0.032			0.086 / 0.11	0.095 / 0.11	0.083 / 0.11		0.075 / 0.11	0.083 / 0.11	0.098 / 0.10	0.088 / 0.11	
Ca	73.4											
Cu	0.63											
Fe	17.9											
Mg	5.7											
Ni	0.51											
Nb	8.8		3.1 / 5.3	1.8 / 5.6							1.8 / 5.3	
Si	85.3											
Na	75.9	151.8										
Sr	0.42											
Sn	0.31						0.40 / 0.42					
W	0.66			0.69 / 1.1	0.55 / 1.1	0.47 / 1.1	0.33 / 1.0	0.36 / 1.1	0.40 / 1.1	0.31 / 1.0	0.68 / 1.1	0.51 / 1.0

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".

LDC #: 18100F4
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

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

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /16 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	16	Action Level	11	12	13	14	15					
Cd	0.032				0.10 / 0.11	0.10 / 0.11	0.088 / 0.11					
Ca	73.4											
Cu	0.63											
Fe	17.9											
Mg	5.7											
Ni	0.51											
Nb	8.8											
Si	85.3											
Na	75.9	151.8										
Sr	0.42											
Sn	0.31											
W	0.66		0.43 / 1.1	0.53 / 1.1	0.34 / 1.1	0.36 / 1.1	0.36 / 1.1					

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".

LDC #: 18107F4
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MH
2nd Reviewer: [illegible]

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 a matrix spike analyzed for each matrix in this SDG?

Y N N/A 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.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	17/18	Soil	Sb	53.1	55.1		All Soil	J- /UJ/A
			Cu	62.6				↓
			Mg	66.2				J+ UJ/A
			Nb	170.9	197.3			J/UJ/A
			P	59.3	129.0			J+ UJ/A
			Si	200.1	169.5			J- /UJ/A
			W	74.0	74.0			↓
			Zn	64.7				J+ UJ/A
			Ba		146.5			J- /UJ/A
			Zr		68.9			
			Mn			30.0 (≤20)		No qual (LCS ok)
			P			34.1 ↓	↓	↓

Comments:

LDC #: 18100F4
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: LW
2nd Reviewer: R

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

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

(Y) N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1		8	Soil	Al	12.0	All Soil	J (+) A
				Ca	18.7		
				Co	11.7		
				Fe	16.7		
				Mg	12.8		
				Mn	18.6		
				P	14.3		
				K	10.2		
				Sr	20.4		
				Ti	10.9		
				V	13.7		

Comments: Cu, Ni < 100 X MDL

SDILICPMS.wpd

LDC#: 18100F4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 5	Concentration (mg/kg) 6	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	5460	7740	35			
Antimony	0.14	0.20		0.06	(≤1.1)	
Arsenic	2.8	4.2		1.4	(≤2.2)	
Barium	67.0	122	58			J det / A
Beryllium	0.45	0.55		0.1	(≤0.22)	
Boron	3.7	4.5		0.8	(≤21.6)	
Cadmium	0.11	0.075		0.035	(≤0.11)	
Calcium	62400	23200	92			J det / A
Chromium	7.4	12.4		5	(≤2.2)	J det / A
Cobalt	5.3	7.5	34			
Copper	10.4	15.3	38			
Iron	9400	14900	45			
Lead	5.1	7.9	43			
Magnesium	7150	8550	18			
Manganese	154	262	52			J det / A
Molybdenum	0.29	0.50		0.21	(≤1.1)	
Nickel	13.0	15.7	19			
Palladium	0.26	0.31		0.05	(≤0.22)	
Phosphorus	922	1090	17			

LDC#: 18100F4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 5	Concentration (mg/kg) 6	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Potassium	1340	1710	24			
Silicon	177	121	38			
Silver	0.064	0.085		0.021	(≤0.43)	
Sodium	261	471	57			J det / A
Strontium	170	216	24			
Thallium	0.18	0.19		0.01	(≤0.43)	
Tin	0.40	0.55		0.15	(≤0.43)	
Titanium	356	590	49			
Tungsten	0.33	0.36		0.03	(≤1.1)	
Uranium	0.86	1.2	33			
Vanadium	27.4	51.7	61			J det / A
Zinc	25.9	31.7	20			
Zirconium	14.4	21.7		7.3	(≤21.6)	
Lithium	7.8	15.4		7.6	(≤10.8)	
Mercury (ug/Kg)	16.6	10.3		6.3	(≤36.0)	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 21, 2008

Matrix: Soil/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD

Introduction

This data review covers 16 soil samples and one water sample 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.

Raw data were not reviewed for this SDG. The review was 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
12/27/07	CCV (21:56)	Boron Vanadium	111.5 (90-110) 113.1 (90-110)	PBW	J+ (all detects) J+ (all detects)	P
12/27/07	CCV (23:14)	Boron	112.1 (90-110)	All water samples in SDG TRNC-D-7	J+ (all detects)	P
12/28/07	CCV (00:32)	Vanadium	111.9 (90-110)	RINSATE-5	J+ (all detects)	P

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)	Copper Manganese Nickel Tin	0.50 ug/L 0.62 ug/L 0.87 ug/L 0.35 ug/L	All water samples in SDG TRNC-D-7
ICB/CCB	Cadmium Copper Molybdenum Nickel Niobium Thallium Tungsten	0.045 ug/L 0.4 ug/L 0.2 ug/L 0.5 ug/L 14.9 ug/L 0.7 ug/L 1.3 ug/L	All water samples in SDG TRNC-D-7

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium Copper Iron Nickel Phosphorus Sodium Mercury	0.55 mg/Kg 0.11 mg/Kg 11.2 mg/Kg 0.12 mg/Kg 2.0 mg/Kg 3.5 mg/Kg 7.5 ug/Kg	All soil samples in SDG TRNC-D-7
PB (prep blank)	Zinc	2.8 mg/Kg	TSB-GR-02-0' TSB-GR-02-5' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'
ICB/CCB	Cadmium Chromium Niobium Thallium Tungsten Vanadium Mercury	0.0329 ug/L 1.4 ug/L 9.8 ug/L 0.6 ug/L 0.6 ug/L 1.3 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-7

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-5	Cadmium Manganese Molybdenum Niobium Thallium Tin Tungsten	0.024 ug/L 0.63 ug/L 0.42 ug/L 23.3 ug/L 1.5 ug/L 0.65 ug/L 2.5 ug/L	0.50U ug/L 2.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L
TSB-GR-02-0'	Niobium Thallium Tungsten Mercury	3.0 mg/Kg 0.28 mg/Kg 0.73 mg/Kg 7.6 ug/Kg	5.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg
TSB-GR-02-0'-FD	Cadmium Niobium Thallium Tungsten Mercury	0.10 mg/Kg 2.2 mg/Kg 0.21 mg/Kg 036 mg/Kg 16.4 ug/Kg	0.11U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.3U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GR-02-5'	Cadmium Thallium Tungsten Mercury	0.10 mg/Kg 0.22 mg/Kg 0.44 mg/Kg 15.1 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg
TSB-GJ-04-0'	Cadmium Niobium Thallium Tungsten Mercury	0.077 mg/Kg 3.0 mg/Kg 0.18 mg/Kg 0.33 mg/Kg 16.5 ug/Kg	0.11U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.2U ug/Kg
TSB-GJ-04-5'	Cadmium Thallium Tungsten Mercury	0.092 mg/Kg 0.34 mg/Kg 0.57 mg/Kg 10.6 ug/Kg	0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.5U ug/Kg
TSB-GJ-02-0'	Cadmium Thallium Tungsten Mercury	0.071 mg/Kg 0.22 mg/Kg 0.43 mg/Kg 10.0 ug/Kg	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.5U ug/Kg
TSB-GJ-02-0'-FD	Cadmium Thallium Tungsten Mercury	0.076 mg/Kg 0.21 mg/Kg 0.38 mg/Kg 8.9 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg
TSB-GJ-02-5'	Cadmium Niobium Thallium Tungsten Mercury	0.054 mg/Kg 2.8 mg/Kg 0.16 mg/Kg 0.33 mg/Kg 13.5 ug/Kg	0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg
TSB-GJ-07-0'	Cadmium Thallium Tungsten Mercury	0.088 mg/Kg 0.23 mg/Kg 0.40 mg/Kg 14.9 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.9U ug/Kg
TSB-GJ-07-5'	Cadmium Thallium Tungsten Mercury	0.074 mg/Kg 0.17 mg/Kg 0.38 mg/Kg 22.9 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg
TSB-GJ-05-0'	Cadmium Thallium Tungsten Mercury	0.078 mg/Kg 0.17 mg/Kg 0.33 mg/Kg 17.4 ug/Kg	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.4U ug/Kg
TSB-GJ-05-5'	Thallium Tungsten	0.22 mg/Kg 0.40 mg/Kg	0.42U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GJ-03-0'	Cadmium Thallium Tungsten Mercury	0.081 mg/Kg 0.16 mg/Kg 0.31 mg/Kg 11.8 ug/Kg	0.10U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 33.6U ug/Kg
TSB-GJ-03-5'	Cadmium Thallium Tungsten Mercury	0.091 mg/Kg 0.20 mg/Kg 0.33 mg/Kg 11.5 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg

Sample RINSATE-5 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-5	11/19/07	Boron Cadmium Calcium Iron Magnesium Manganese Molybdenum Niobium Silicon Sodium Strontium Thallium Tin Tungsten	28.8 ug/L 0.024 ug/L 67.1 ug/L 30.0 ug/L 6.6 ug/L 0.63 ug/L 0.42 ug/L 23.3 ug/L 50.3 ug/L 64.4 ug/L 0.37 ug/L 1.5 ug/L 0.65 ug/L 2.5 ug/L	All soil samples in SDG TRNC-D-7

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-GR-02-0'	Boron Molybdenum Thallium Tungsten	10.1 mg/Kg 0.62 mg/Kg 0.28 mg/Kg 0.73 mg/Kg	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-GR-02-0'-FD	Boron Cadmium Molybdenum Niobium Thallium Tungsten	6.9 mg/Kg 0.10 mg/Kg 0.52 mg/Kg 3.0 mg/Kg 0.21 mg/Kg 0.36 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GR-02-5'	Boron	7.3 mg/Kg	21.3U mg/Kg
	Cadmium	0.10 mg/Kg	0.11U mg/Kg
	Molybdenum	0.56 mg/Kg	1.1U mg/Kg
	Niobium	2.2 mg/Kg	5.3U mg/Kg
	Thallium	0.22 mg/Kg	0.43U mg/Kg
	Tungsten	0.44 mg/Kg	1.1U mg/Kg
TSB-GJ-04-0'	Boron	6.7 mg/Kg	21.7U mg/Kg
	Cadmium	0.077 mg/Kg	0.11U mg/Kg
	Molybdenum	0.59 mg/Kg	1.1U mg/Kg
	Thallium	0.18 mg/Kg	0.44U mg/Kg
	Tungsten	0.33 mg/Kg	1.1U mg/Kg
TSB-GJ-04-5'	Boron	7.9 mg/Kg	21.9U mg/Kg
	Cadmium	0.092 mg/Kg	0.11U mg/Kg
	Molybdenum	0.63 mg/Kg	1.1U mg/Kg
	Niobium	3.0 mg/Kg	5.5U mg/Kg
	Thallium	0.34 mg/Kg	0.44U mg/Kg
	Tungsten	0.57 mg/Kg	1.1U mg/Kg
TSB-GJ-02-0'	Boron	7.3 mg/Kg	20.7U mg/Kg
	Cadmium	0.071 mg/Kg	0.10U mg/Kg
	Molybdenum	0.43 mg/Kg	1.0U mg/Kg
	Thallium	0.22 mg/Kg	0.41U mg/Kg
	Tungsten	0.43 mg/Kg	1.0U mg/Kg
TSB-GJ-02-0'-FD	Boron	6.7 mg/Kg	21.3U mg/Kg
	Cadmium	0.076 mg/Kg	0.11U mg/Kg
	Molybdenum	0.52 mg/Kg	1.1U mg/Kg
	Thallium	0.21 mg/Kg	0.43U mg/Kg
	Tungsten	0.38 mg/Kg	1.1U mg/Kg
TSB-GJ-02-5'	Boron	5.3 mg/Kg	21.3U mg/Kg
	Cadmium	0.054 mg/Kg	0.11U mg/Kg
	Molybdenum	0.44 mg/Kg	1.1U mg/Kg
	Thallium	0.16 mg/Kg	0.43U mg/Kg
	Tungsten	0.33 mg/Kg	1.1U mg/Kg
TSB-GJ-07-0'	Boron	5.6 mg/Kg	21.5U mg/Kg
	Cadmium	0.088 mg/Kg	0.11U mg/Kg
	Molybdenum	0.50 mg/Kg	1.1U mg/Kg
	Niobium	2.8 mg/Kg	5.4U mg/Kg
	Thallium	0.23 mg/Kg	0.43U mg/Kg
	Tungsten	0.40 mg/Kg	1.1U mg/Kg
TSB-GJ-07-5'	Boron	10.2 mg/Kg	21.5U mg/Kg
	Cadmium	0.074 mg/Kg	0.11U mg/Kg
	Molybdenum	0.53 mg/Kg	1.1U mg/Kg
	Thallium	0.17 mg/Kg	0.43U mg/Kg
	Tungsten	0.38 mg/Kg	1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GJ-05-0'	Boron Cadmium Molybdenum Thallium Tungsten	8.2 mg/Kg 0.078 mg/Kg 0.54 mg/Kg 0.17 mg/Kg 0.33 mg/Kg	20.6U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-GJ-05-5'	Boron Molybdenum Thallium Tungsten	7.7 mg/Kg 0.76 mg/Kg 0.22 mg/Kg 0.40 mg/Kg	21.2U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-GJ-03-0'	Boron Cadmium Molybdenum Thallium Tungsten	5.3 mg/Kg 0.081 mg/Kg 0.57 mg/Kg 0.16 mg/Kg 0.31 mg/Kg	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-GJ-03-5'	Boron Cadmium Molybdenum Thallium Tungsten	4.5 mg/Kg 0.091 mg/Kg 0.47 mg/Kg 0.20 mg/Kg 0.33 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U 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-GJ-04-0'MS/MSD (All soil samples in SDG TRNC-D-7)	Antimony	57.1 (75-125)	50.6 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-GJ-04-0'MS/MSD (All soil samples in SDG TRNC-D-7)	Niobium Silicon	205.5 (75-125) 142.9 (75-125)	187.0 (75-125) 142.8 (75-125)	- -	J+ (all detects) J+ (all detects)	A

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	Calcium	80.9 (81-119)	All soil samples in SDG TRNC-D-7	J- (all detects) UJ (all non-detects)	P

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in this SDG.

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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-GJ-04-0'L	Iron Manganese	10.2 (≤10) 11.8 (≤10)	All soil samples in SDG TRNC-D-7	J (all detects) J (all detects)	A

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Aluminum	8470	8560	1 (≤50)	-	-	-
Antimony	0.25	0.19	-	0.06 (≤1.1)	-	-
Arsenic	2.9	2.4	-	0.5 (≤2.1)	-	-
Barium	185	156	17 (≤50)		-	-
Beryllium	0.60	0.59	-	0.01 (≤0.21)	-	-
Boron	10.1	6.9	-	3.2 (≤21.2)	-	-
Cadmium	0.13	0.10	-	0.03 (≤0.11)	-	-
Calcium	25000	18200	31 (≤50)	-	-	-
Chromium	11.7	10.7	9 (≤50)	-	-	-
Cobalt	7.9	6.8	15 (≤50)	-	-	-
Copper	15.6	13.5	14 (≤50)	-	-	-
Iron	14100	12800	10 (≤50)	-	-	-
Lead	10.1	10.0	1 (≤50)	-	-	-
Magnesium	8910	8120	9 (≤50)	-	-	-
Manganese	393	320	20 (≤50)	-	-	-
Molybdenum	0.62	0.52	-	0.1 (≤1.1)	-	-
Nickel	14.7	13.0	12 (≤50)	-	-	-
Niobium	9.2	3.0	-	6.2 (≤5.3)	-	-
Palladium	0.44	0.33	-	0.11 (≤0.21)	-	-
Phosphorus	1010	811	22 (≤50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Potassium	2150	2270	5 (≤50)	-	-	-
Silicon	180	173	4 (≤50)	-	-	-
Silver	0.12	0.12	-	0 (≤0.42)	-	-
Sodium	687	482	35 (≤50)	-	-	-
Strontium	200	151	28 (≤50)	-	-	-
Thallium	0.28	0.21	-	0.07 (≤0.42)	-	-
Tin	0.63	0.56	-	0.07 (≤0.42)	-	-
Titanium	577	546	6 (≤50)	-	-	-
Tungsten	0.73	0.36	-	0.37 (≤1.1)	-	-
Uranium	1.0	0.80	-	0.2 (≤0.21)	-	-
Vanadium	41.4	35.5	15 (≤50)	-	-	-
Zinc	30.8	29.8	3 (≤50)	-	-	-
Zirconium	22.8	21.2	-	1.6 (≤21.2)	-	-
Lithium	14.3	10.0	-	4.3 (≤10.6)	-	-
Sulfur	681	498	-	183 (≤1060)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Mercury	7.6	16.4	-	8.8 (≤35.3)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Aluminum	7400	7970	7 (≤50)	-	-	-
Antimony	0.18	0.19	-	0.01 (≤1.1)	-	-
Arsenic	3.4	2.9	-	0.5 (≤2.1)	-	-
Barium	171	170	1 (≤50)	-	-	-
Beryllium	0.48	0.51	-	0.03 (≤0.21)	-	-
Boron	7.3	6.7	-	0.6 (≤21.3)	-	-
Cadmium	0.071	0.076	-	0.005 (≤0.11)	-	-
Calcium	22800	26900	16 (≤50)	-	-	-
Chromium	8.2	11.1	30 (≤50)	-	-	-
Cobalt	6.0	7.8	26 (≤50)	-	-	-
Copper	13.2	15.6	17 (≤50)	-	-	-
Iron	11400	13400	16 (≤50)	-	-	-
Lead	7.1	9.8	32 (≤50)	-	-	-
Magnesium	9840	10100	3 (≤50)	-	-	-
Manganese	262	341	26 (≤50)	-	-	-
Molybdenum	0.43	0.52	-	0.09 (≤1.1)	-	-
Nickel	12.5	16.7	29 (≤50)	-	-	-
Palladium	0.51	0.53	-	0.02 (≤0.21)	-	-
Phosphorus	885	1140	25 (≤50)	-	-	-
Potassium	1520	1730	13 (≤50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Silicon	72.5	147	-	74.5 (≤53.2)	J (all detects)	A
Silver	0.086	0.10	-	0.014 (≤0.43)	-	-
Sodium	583	542	7 (≤50)	-	-	-
Strontium	253	225	12 (≤50)	-	-	-
Thallium	0.22	0.21	-	0.01 (≤0.43)	-	-
Tin	0.43	0.54	-	0.11 (≤0.43)	-	-
Titanium	442	507	14 (≤50)	-	-	-
Tungsten	0.43	0.38	-	0.05 (≤1.1)	-	-
Uranium	1.5	1.1	31 (≤50)	-	-	-
Vanadium	34.8	40.9	16 (≤50)	-	-	-
Zinc	27.1	34.0	23 (≤50)	-	-	-
Zirconium	18.0	22.0	-	4 (≤21.3)	-	-
Lithium	21.9	15.8	-	6.1 (≤10.6)	-	-
Sulfur	451	448U	-	3 (≤1060)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Mercury	10.0	8.9	-	1.1 (≤35.4)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-7	RINSATE-5	Boron Vanadium	J+ (all detects) J+ (all detects)	P	Calibration (CCV %R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Niobium Silicon	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Calcium	J- (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Iron Manganese	J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-7	TSB-GJ-02-0' TSB-GJ-02-0'-FD	Silicon	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	RINSATE-5	Cadmium Manganese Molybdenum Niobium Thallium Tin Tungsten	0.50U ug/L 2.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L	A
TRNC-D-7	TSB-GR-02-0'	Niobium Thallium Tungsten Mercury	5.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg	A
TRNC-D-7	TSB-GR-02-0'-FD	Cadmium Niobium Thallium Tungsten Mercury	0.11U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.3U ug/Kg	A
TRNC-D-7	TSB-GR-02-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg	A
TRNC-D-7	TSB-GJ-04-0'	Cadmium Niobium Thallium Tungsten Mercury	0.11U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.2U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	TSB-GJ-04-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.5U ug/Kg	A
TRNC-D-7	TSB-GJ-02-0'	Cadmium Thallium Tungsten Mercury	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.5U ug/Kg	A
TRNC-D-7	TSB-GJ-02-0'-FD	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg	A
TRNC-D-7	TSB-GJ-02-5'	Cadmium Niobium Thallium Tungsten Mercury	0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg	A
TRNC-D-7	TSB-GJ-07-0'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.9U ug/Kg	A
TRNC-D-7	TSB-GJ-07-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg	A
TRNC-D-7	TSB-GJ-05-0'	Cadmium Thallium Tungsten Mercury	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.4U ug/Kg	A
TRNC-D-7	TSB-GJ-05-5'	Thallium Tungsten	0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-03-0'	Cadmium Thallium Tungsten Mercury	0.10U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 33.6U ug/Kg	A
TRNC-D-7	TSB-GJ-03-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	TSB-GR-02-0'	Boron Molybdenum Thallium Tungsten	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GR-02-0'-FD	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GR-02-5'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-04-0'	Boron Cadmium Molybdenum Thallium Tungsten	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-04-5'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-02-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.7U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GJ-02-0'-FD	Boron Cadmium Molybdenum Thallium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-02-5'	Boron Cadmium Molybdenum Thallium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	TSB-GJ-07-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-07-5'	Boron Cadmium Molybdenum Thallium Tungsten	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-05-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.6U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GJ-05-5'	Boron Molybdenum Thallium Tungsten	21.2U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-03-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GJ-03-5'	Boron Cadmium Molybdenum Thallium Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

LDC #: 18100G4
SDG #: TRNC-D-7
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/18/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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	A	Sampling dates: 11/19/07
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3 MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	Les
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(1,2), (6,7)
XIV.	Field Blanks	SW	R=15

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: All soil except #15 A2

1	TSB-GR-02-0'	11	TSB-GJ-05-0'	21		31	
2	TSB-GR-02-0'-FD	12	TSB-GJ-05-5'	22		32	
3	TSB-GR-02-5'	13	TSB-GJ-03-0'	23		33	
4	TSB-GJ-04-0'	14	TSB-GJ-03-5'	24		34	
5	TSB-GJ-04-5'	15	RINSATE-5 A2	25		35	
6	TSB-GJ-02-0'	16	TSB-GJ-04-0'MS	26		36	
7	TSB-GJ-02-0'-FD	17	TSB-GJ-04-0'MSD	27		37	
8	TSB-GJ-02-5'	18	PB	28		38	
9	TSB-GJ-07-0'	19		29		39	
10	TSB-GJ-07-5'	20		30		40	

Notes:

LDC #: 18100G4
SDG #: TRNC-D-7

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-15	Soil/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,
16,17	Soil	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, 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,
1-15	Soil/M	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
16,17	Soil	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,
		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, S,
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,
GFAA		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, CN,

Comments: Mercury by CVAA if performed
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18100G4
SDG #: TRNC-D-7

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: lun
2nd Reviewer: [illegible]

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

Y (N) N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N (N/A) Was a midrange cyanide standard distilled?

Y N (N/A) Are all correlation coefficients ≥0.995?

Y N (N/A) 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
1	12/7/07	CCV (x156)	B	111.5	PBW	J+ UT/P
			V	113.1	V	V
2	12/7/07	CCV (x314)	B	112.1	All AQ	J+ UT/P
3	12/8/07	CCV (0032)	V	111.9	15	J+ UT/P

Comments: _____

LDC #: 18100G4
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:
Associated Samples: All AQ

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	15									
Cd			0.045		0.024 / 0.50									
Cu		0.50	0.4											
Mn		0.62			0.63 / 2.0									
Mo			0.2		0.42 / 5.0									
Ni		0.87	0.5											
Nb			14.9		23.3 / 25.0									
Tl			0.7		1.5 / 2.0									
Sn		0.35			0.65 / 2.0									
W			1.3		2.5 / 5.0									

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 #: 18100G4
SDG #: TRNC-D-7
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All Soil except Zn:1,3,7-14

Reviewer:
2nd Reviewer:

				Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10
Cd		0.0329			0.10 / 0.11	0.10 / 0.11	0.077 / 0.11	0.092 / 0.11	0.071 / 0.10	0.076 / 0.11	0.054 / 0.11	0.088 / 0.11	0.074 / 0.11
Cr	0.55	1.4											
Cu	0.11												
Fe	11.2		112										
Ni	0.12												
Nb		9.8		3.0 / 5.3	2.2 / 5.3		3.0 / 5.5				2.8 / 5.4		
P	2.0												
Na	3.5												
Tl		0.6		0.28 / 0.41	0.21 / 0.42	0.22 / 0.43	0.18 / 0.44	0.34 / 0.44	0.22 / 0.41	0.21 / 0.43	0.16 / 0.43	0.23 / 0.43	0.17 / 0.43
W		0.6		0.73 / 1.0	0.36 / 1.1	0.44 / 1.1	0.33 / 1.1	0.57 / 1.1	0.43 / 1.0	0.38 / 1.1	0.33 / 1.1	0.40 / 1.1	0.38 / 1.1
V		1.3											
Zn	2.8		28										
Hg (ug/Kg)	7.5	0.1		7.6 / 34.3	16.4 / 35.3	15.1 / 35.5	16.5 / 36.2	10.6 / 36.5	10.0 / 34.5	8.9 / 35.4	13.5 / 35.5	14.9 / 35.9	22.9 / 35.8

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 #: 18100G4
SDG #: TRNC-D-7
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All Soil except Zn:1,3,7-14

Reviewer:
2nd Reviewer:

				Sample Identification									
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum ICB/CCB[a] (ug/l)**	**Blank Action Limit**	11	12	13	14						
Cd		0.0329		0.078 / 0.10		0.081 / 0.10	0.091 / 0.11						
Cr	0.55	1.4											
Cu	0.11												
Fe	11.2		112										
Ni	0.12												
Nb		9.8											
P	2.0												
Na	3.5												
Tl		0.6		0.17 / 0.41	0.22 / 0.42	0.16 / 0.40	0.20 / 0.43						
W		0.6		0.33 / 1.0	0.40 / 1.1	0.31 / 1.0	0.33 / 1.1						
V		1.3											
Zn	2.8		28										
Hg (ug/Kg)	7.5	0.1		17.4 / 34.4		11.8 / 33.6	11.5 / 35.4						

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 #: 18100G4
SDG #: TRNC-D-7

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: L
2nd Reviewer: R

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /19 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	15	Action Level	1	2	3	4	5	6	7	8	9	10
B	28.8		10.1 / 20.6	6.9 / 21.2	7.3 / 21.3	6.7 / 21.7	7.9 / 21.9	7.3 / 20.7	6.7 / 21.3	5.3 / 21.3	5.6 / 21.5	10.2 / 21.5
Cd	0.024			0.10 / 0.11	0.10 / 0.11	0.077 / 0.11	0.092 / 0.11	0.071 / 0.10	0.076 / 0.11	0.054 / 0.11	0.088 / 0.11	0.074 / 0.11
Ca	67.1											
Fe	30.0											
Mg	6.6											
Mn	0.63											
Mo	0.42		0.62 / 1.0	0.52 / 1.1	0.56 / 1.1	0.59 / 1.1	0.63 / 1.1	0.43 / 1.0	0.52 / 1.1	0.44 / 1.1	0.50 / 1.1	0.53 / 1.1
Nb	23.3			3.0 / 5.3	2.2 / 5.3		3.0 / 5.5				2.8 / 5.4	
Si	50.3											
Na	64.4	128.8										
Sr	0.37											
Tl	1.5		0.28 / 0.41	0.21 / 0.42	0.22 / 0.43	0.18 / 0.44	0.34 / 0.44	0.22 / 0.41	0.21 / 0.43	0.16 / 0.43	0.23 / 0.43	0.17 / 0.43
Sn	0.65											
W	2.5		0.73 / 1.0	0.36 / 1.1	0.44 / 1.1	0.33 / 1.1	0.57 / 1.1	0.43 / 1.0	0.38 / 1.1	0.33 / 1.1	0.40 / 1.1	0.38 / 1.1

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".

LDC #: 18100G4
SDG #: TRNC-D-7

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11 /19 /07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification											
	15	Action Level	11	12	13	14							
B	28.8		8.2 / 20.6	7.7 / 21.2	5.3 / 20.2	4.5 / 21.2							
Cd	0.024		0.078 / 0.10		0.081 / 0.10	0.091 / 0.11							
Ca	67.1												
Fe	30.0												
Mg	6.6												
Mn	0.63												
Mo	0.42		0.54 / 1.0	0.76 / 1.1	0.57 / 1.0	0.47 / 1.1							
Nb	23.3												
Si	50.3												
Na	64.4	128.8											
Sr	0.37												
Tl	1.5		0.17 / 0.41	0.22 / 0.42	0.16 / 0.40	0.20 / 0.43							
Sn	0.65												
W	2.5		0.33 / 1.0	0.40 / 1.1	0.31 / 1.0	0.33 / 1.1							

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".

LDC #: 18100G4
SDG #: TRNC-D-7

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MY
2nd Reviewer: G

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 a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	16/17	soil	Sb	57.1	50.6		All soil	J-/UJ/A
			Nb	205.5	187.0		↓	J+/A
			Si	142.9	142.8			↓
			Mn			44.1 (≤20)	All	No qual (LCS in)

Comments:

LDC #: 18160G4
SDG #: TRNC-N-7

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: MH
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".

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	Soil	Ca	80.9 (81-119)	All Soil	J-/UJ/P

Comments:

LDC #: 18004Y

SDG #: Tracer

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: [signature]

2nd Reviewer: [signature]

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

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

Y (N) N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?

Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?

Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1		4	Soil	Fe	10.2	All Soil	J (+) A
				Mn	11.8	↓	↓

Comments: Cm, V

SDILICPMS.wpd

LDC#: 18100G4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 1	Concentration (mg/kg) 2	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	8470	8560	1			
Antimony	0.25	0.19		0.06	(≤1.1)	
Arsenic	2.9	2.4		0.5	(≤2.1)	
Barium	185	156	17			
Beryllium	0.60	0.59		0.01	(≤0.21)	
Boron	10.1	6.9		3.2	(≤21.2)	
Cadmium	0.13	0.10		0.03	(≤0.11)	
Calcium	25000	18200	31			
Chromium	11.7	10.7	9			
Cobalt	7.9	6.8	15			
Copper	15.6	13.5	14			
Iron	14100	12800	10			
Lead	10.1	10.0	1			
Magnesium	8910	8120	9			
Manganese	393	320	20			
Molybdenum	0.62	0.52		0.1	(≤1.1)	
Nickel	14.7	13.0	12			
Niobium	9.2	3.0		6.2	(≤5.3)	J det / A
Palladium	0.44	0.33		0.11	(≤0.21)	

LDC#: 18100G4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 1	Concentration (mg/kg) 2	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Phosphorus	1010	811	22			
Potassium	2150	2270	5			
Silicon	180	173	4			
Silver	0.12	0.12		0	(≤0.42)	
Sodium	687	482	35			
Strontium	200	151	28			
Thallium	0.28	0.21		0.07	(≤0.42)	
Tin	0.63	0.56		0.07	(≤0.42)	
Titanium	577	546	6			
Tungsten	0.73	0.36		0.37	(≤1.1)	
Uranium	1.0	0.80		0.2	(≤0.21)	
Vanadium	41.4	35.5	15			
Zinc	30.8	29.8	3			
Zirconium	22.8	21.2		1.6	(≤21.2)	
Lithium	14.3	10.0		4.3	(≤10.6)	
Sulfur	681	498		183	(≤1060)	
Mercury (ug/Kg)	7.6	16.4		8.8	(≤35.3)	

LDC#: 18100G4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg) 6	Concentration (mg/kg) 7	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	7400	7970	7			
Antimony	0.18	0.19		0.01	(≤1.1)	
Arsenic	3.4	2.9		0.5	(≤2.1)	
Barium	171	170	1			
Beryllium	0.48	0.51		0.03	(≤0.21)	
Boron	7.3	6.7		0.6	(≤21.3)	
Cadmium	0.071	0.076		0.005	(≤0.11)	
Calcium	22800	26900	16			
Chromium	8.2	11.1	30			
Cobalt	6.0	7.8	26			
Copper	13.2	15.6	17			
Iron	11400	13400	16			
Lead	7.1	9.8	32			
Magnesium	9840	10100	3			
Manganese	262	341	26			
Molybdenum	0.43	0.52		0.09	(≤1.1)	
Nickel	12.5	16.7	29			
Palladium	0.51	0.53		0.02	(≤0.21)	
Phosphorus	~~993~~ 885	~~885~~ 1140	~~12~~			

LDC#: 18100G4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: V
2nd Reviewer: V

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
	6	7	RPD	Difference	Limits	(Parent Only)
Potassium	1520	1730	13			
Silicon	72.5	147		74.5	(≤53.2)	J det / A
Silver	0.086	0.10		0.014	(≤0.43)	
Sodium	583	542	7			
Strontium	253	225	12			
Thallium	0.22	0.21		0.01	(≤0.43)	
Tin	0.43	0.54		0.11	(≤0.43)	
Titanium	442	507	14			
Tungsten	0.43	0.38		0.05	(≤1.1)	
Uranium	1.5	1.1	31			
Vanadium	34.8	40.9	16			
Zinc	27.1	34.0	23			
Zirconium	18.0	22.0		4	(≤21.3)	
Lithium	21.9	15.8		6.1	(≤10.6)	
Sulfur	451	448U		3	(≤1060)	
Mercury (ug/Kg)	10.0	8.9		1.1	(≤35.4)	

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

Wet Chemistry

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 18, 2008

Matrix: Soil/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
TSB-CR-07-0'DUP
RINSATE 1MS
RINSATE 1DUP

Introduction

This data review covers 14 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 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
MB	Chloride Orthophosphate as P	0.34 mg/Kg 3.5 mg/Kg	All soil samples in SDG TRNC-D-1
ICB/CCB1	Orthophosphate as P	0.366 mg/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'
ICB/CCB2	Orthophosphate as P	0.152 mg/L	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'
ICB/CCB3	Orthophosphate as P	0.146 mg/L	TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'

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

Sample RINSATE 1 was identified as a rinsate. No contaminant concentrations were found in this blank.

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-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Oil & grease	68 (75-125)	59 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-CR-07-0'MS (All soil samples in SDG TRNC-D-1)	Nitrate as N	72 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Sulfate	64 (75-125)	-	-	J- (all detects) UJ (all non-detects)	
TSB-CR-07-0'MS (All soil samples in SDG TRNC-D-1)	Nitrite as N	170 (75-125)	-	-	J+ (all detects)	A

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

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Bromide	0.065U mg/Kg	0.85 mg/Kg	-	0.785 (≤2.6)	-	-
Bromine	0.13U mg/Kg	1.7 mg/Kg	-	1.57 (≤5.2)	-	-
Chloride	245 mg/Kg	371 mg/Kg	41 (≤50)	-	-	-
Chlorine	491 mg/Kg	741 mg/Kg	41 (≤50)	-	-	-
Nitrate as N	9.9 mg/Kg	11.1 mg/Kg	11 (≤50)	-	-	-
Perchlorate	1110 ug/Kg	821 ug/Kg	30 (≤50)	-	-	-
Sulfate	1390 mg/Kg	583 mg/Kg	82 (≤50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Oil & grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Nitrate as N Sulfate	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Nitrite as N	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	Sulfate	J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A6
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/15/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method ~~7091~~ 9071B)

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	A	Sampling dates: 11/9/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/1 sp
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(3, 4)
X	Field blanks	ND	R=12

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: All Soil event # 12,16,17 Aq

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21		31	
2	TSB-CR-07-10'	12	RINSATE 1	22		32	
3	TSB-CJ-08-0'	13	TSB-CR-07-0'MS	23		33	
4	TSB-CJ-08-0'-FD	14	TSB-CR-07-0'MSD	24		34	
5	TSB-CJ-08-10'	15	TSB-CR-07-0'DUP	25		35	
6	TSB-CJ-04-0'	16	RINSATE 1MS	26		36	
7	TSB-CJ-04-10'	17	RINSATE 1DUP	27		37	
8	TSB-CJ-07-0'	18	MB	28		38	
9	TSB-CJ-07-10'	19		29		39	
10	TSB-CJ-03-0'	20		30		40	

Notes: _____

LDC #: 18100A6
SDG #: TRNCED-1

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-11	Soil	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] [✓ ClO_4] [✓ O+G]/TPH
12	Aq	[✓ Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4] O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
16, 17	Aq	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
13, 14	Soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] [✓ O+G]/TPH
13, 15	↓	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH

Comments:

LDC #: 18100A6
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: MY
2nd Reviewer:

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Were all samples associated with a given method blank?
Y N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/kg **Associated Samples:** MB: All Soil, CCB1 = 1-3, CCB2 = 4-8, CCB3 = 9-11 (ND or > RL)

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
	MB	mg/L										
Cl	0.34											
o-PO4-P	3.5											
CCB1 o-PO4-P		0.366										
CCB2 o-PO4-P		0.152										
CCB3 o-PO4-P		0.146										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100A6
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See comment

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	13, 14	Soil	0+G	68	59		All Soil	J-/UJ/A

Comments:

LDC #: 18100A6
SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method Soil conv

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	13	Soil	NO_3-N	72	All Soil	J- (all) / A
			NO_2-N	170	↓	J+ (all) / A
			SO_4	64	↓	J- (all) / A

Comments:

LDC#: 18100A6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: MC
2nd Reviewer: [signature]

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	3	4				
Bromide	0.065U	0.85		0.785	(≤2.6)	
Bromine	0.13U	1.7		1.57	(≤5.2)	
Chloride	245	371	41			
Chlorine	491	741	41			
Nitrate as N	9.9	11.1	11			
Perchlorate (ug/Kg)	1110	821	30			
Sulfate	1390	583	82			J det / A

V:\FIELD DUPLICATES\FD_inorganic\18100A6.wpd

LDC Report# 18100B6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 22, 2008

Matrix: Soil

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD
TSB-CR-01-0'DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 19 soil 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 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.

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	Concentration	Associated Samples
MB	Orthophosphate as P	2.9 mg/Kg	All samples in SDG TRNC-D-2
ICB/CCB	Orthophosphate as P	0.284 mg/L	All samples in SDG TRNC-D-2

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

No field blanks were identified in this SDG.

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-CR-01-0'MS (All samples in SDG TRNC-D-2)	Nitrite as N	174 (75-125)	-	-	J+ (all detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-CR-01-0'MS (All samples in SDG TRNC-D-2)	Oil & grease	71 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	Difference (Limits)	Flag	A or P
TSB-CR-01-0'DUP (All samples in SDG TRNC-D-2)	Chlorate	11.9 mg/Kg (≤5.1)	J (all detects) UJ (all non-detects)	A

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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
Chloride	164 mg/Kg	223 mg/Kg	30 (≤50)	-	-	-
Chlorine	327 mg/Kg	446 mg/Kg	31 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
Nitrate as N	3.1 mg/Kg	3.7 mg/Kg	18 (≤50)	-	-	-
Perchlorate	395 ug/Kg	268 ug/Kg	38 (≤50)	-	-	-
Sulfate	357 mg/Kg	1090 mg/Kg	101 (≤50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Chloride	1.8 mg/Kg	7.5 mg/Kg	-	5.7(≤2.0)	J (all detects)	A
Chlorine	3.5 mg/Kg	15.1 mg/Kg	-	11.6 (≤4.1)	J (all detects)	A
Nitrate as N	0.52 mg/Kg	0.63 mg/Kg	-	0.11 (≤0.20)	-	-
Perchlorate	33.3 ug/Kg	88.0 ug/Kg	-	54.7 (≤40.9)	J (all detects)	A
Sulfate	5.4 mg/Kg	6.6 mg/Kg	-	1.2 (≤5.1)	-	-

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Nitrite as N	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Oil & grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Chlorate	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (Difference)
TRNC-D-2	TSB-CJ-01-0'** TSB-CJ-01-0'-FD**	Sulfate	J (all detects)	A	Field duplicates (RPD)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	Chloride Chlorine Perchlorate	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B6
SDG #: TRNC-D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/16/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: [illegible]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method ~~7091B~~ 9071)

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	A	Sampling dates: 11/12/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	
V	Duplicates	SW	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(3, 5), (14, 15)
X	Field blanks	N	

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

1	TSB-CJ-02-0'**	11	TSB-CR-03-10'	21		31	
2	TSB-CJ-02-10'**	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0'**	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10'**	14	TSB-CJ-06-0'	24		34	
5	TSB-CJ-01-0'-FD**	15	TSB-CJ-06-0'-FD	25		35	
6	TSB-CR-02-0'**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19	TSB-CR-01-0'DUP	29		39	
10	TSB-CR-03-0'	20	MB	30		40	

Notes:

LDC #: 18100136
SDG #: TRHC-V

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MM
2nd Reviewer: [signature]

Method: Inorganics (EPA Method see cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
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)	✓			
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. Matrix Spike/Matrix Spike Duplicates and 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.		✓		
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.		✓		
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% (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 #: 18109B6
SDG #: TRNC-V

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 18100B6
SDG #: TRNCED02

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-16	soil	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] [✓ ClO_4] [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
~17,18	soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
✓17,19	↓	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH

Comments:

LDC #: 18100B6
SDG #: TRNC0-2

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(N) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: ug/ug **Associated Samples:** All (ND)

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
	MB	ug/L										
o,p'-DDT	2.9	0.284										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100B6
SDG #: TRNC-D-2

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see coc

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	17	Soil	NO_2-N	174	All	J+ UJ/A
			O+G	71	↓	J- UJ/A

Comments:

LDC #: 18100B6
SDG #: TRNC-D-2

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

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

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. 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. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

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

#	Duplicate ID	Matrix	Analyte	RPD (Limits) Difference (Limit)	Associated Samples	Qualifications
1	19	Soil	Chromium	11.9 (≤5.1) mg/kg	All	J/NJ/D

Comments:

LDC#: 18100B6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [signature]
2nd Reviewer: [signature]

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	3	5				
Chloride	164	223	30			
Chlorine	327	446	31			
Nitrate as N	3.1	3.7	18			
Perchlorate (ug/Kg)	395	268	38			
Sulfate	357	1090	101			J det / A

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	14	15				
Chloride	1.8	7.5		5.7	(≤2.0)	J det / A
Chlorine	3.5	15.1		11.6	(≤4.1)	J det / A
Nitrate as N	0.52	0.63		0.11	(≤0.20)	
Perchlorate (ug/Kg)	33.3	88.0		54.7	(≤40.9)	J det / A
Sulfate	5.4	6.6		1.2	(≤5.1)	

LDC #: 18100B6
SDG #: TRNC-9-2

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: W
2nd Reviewer: 4

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of F was recalculated.Calibration date: 11/26/07

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

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

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

Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	F	s1	0	0	*0.9998834*	0.999930	Y
		s2	100	0.023			
		s3	250	0.054			
		s4	500	0.122			
		s5	1250	0.31			
		s6	2500	0.631			
Calibration verification	SO4	8	7.875		95.94	95.94	Y
Calibration verification	o-PO4-P	8	8.600		107.75	107.75	Y
Calibration verification	Cl	100	104.3		104	104	Y

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 #: 18102B6
SDG #: JRNC-D-2

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MM
2nd Reviewer:

METHOD: Inorganics, Method See cover

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

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cd	1357	1330	95	94	Y
17	Matrix spike sample	Cd	(SSR-SR) 487	510	96	96	↓
17	Duplicate sample	Cd	46.58	43.74	6.3	6.3	↓

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 #: 18108B6
SDG #: TRNC-D-V

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MH
2nd reviewer: [signature]

METHOD: Inorganics, Method See cover

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

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?
(Y) N N/A Are all detection limits below the CRQL?

Compound (analyte) results for 1 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

$NO_3N = \frac{A_{meas}}{0.00462}$

$NO_3\text{-}N = \frac{0.295 \times 40ml}{0.9457 \times 4g \times 0.00462} = 6752 \text{ ug/kg}$

$= 6.752 \text{ mg/g}$

#	Sample ID	Analyte	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
1	1	Cl	268	268	Y
		Cl	536	536	
		NO_3-N	6.8	6.8	
		ClO_4 (ug/kg)	504	504	
		SO_4	1160	1160	✓

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: January 18, 2008

Matrix: Soil/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'
TSB-DR-06-10'
TSB-DR-05-0'
TSB-DR-05-0'-FD
TSB-DR-05-10'
TSB-DR-03-0'
TSB-DR-03-10'
TSB-DJ-01-0'
TSB-DJ-01-10'
TSB-DR-04-0'
TSB-DR-04-10'
TSB-CR-04-0'
TSB-CR-04-10'
TSB-CR-05-0'
TSB-CR-05-10'
TSB-CR-06-0'
TSB-CR-06-10'
RINSATE-2
TSB-DR-03-0'MS
TSB-DR-03-0'MSD
TSB-DR-03-0'DUP
RINSATE-2MS
RINSATE-2DUP

Introduction

This data review covers 20 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 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.

Raw data were not reviewed for this SDG. The review was 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	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
RINSATE-2	Nitrite as N Nitrate as N Orthophosphate	51.25 hours 51.25 hours 51.25 hours	48 hours 48 hours 48 hours	J- (all detects) UJ (all non-detects)	P
RINSATE-2MS RINSATE-2DUP	Nitrite as N Nitrate as N Orthophosphate	51.5 hours 51.5 hours 51.5 hours	48 hours 48 hours 48 hours	J- (all detects) UJ (all non-detects)	P

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.

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	Concentration	Associated Samples
MB	Orthophosphate as P	2.4 mg/Kg	All soil samples in SDG TRNC-D-3
ICB/CCB	Orthophosphate as P	0.252 mg/L	All soil samples in SDG TRNC-D-3
ICB/CCB	Chloride	0.113 mg/L	TSB-DR-06-10' TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-10' TSB-DR-04-10' TSB-CR-04-10'

Method Blank ID	Analyte	Concentration	Associated Samples
MB	Orthophosphate as P	1.1 mg/L	All water samples in SDG TRNC-D-3
ICB/CCB	Orthophosphate as P	1.05 mg/L	All water samples in SDG TRNC-D-3

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
TSB-DR-03-10'	Orthophosphate as P	4.5 mg/Kg	5.3U mg/Kg
RINSATE-2	Orthophosphate as P	0.47 mg/L	0.50U mg/L

Sample RINSATE-2 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-2	11/13/07	Orthophosphate as P	0.47 mg/L	All soil samples in SDG TRNC-D-3

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-DR-03-10'	Orthophosphate as P	4.5 mg/Kg	5.3U 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-DR-03-0'MS (All soil samples in SDG TRNC-D-3)	Chlorate	74 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Oil & grease	61 (75-125)	-	-	J- (all detects) UJ (all non-detects)	
TSB-DR-03-0'MS (All soil samples in SDG TRNC-D-3)	Nitrite as N	0 (75-125)	-	-	J- (all detects) R (all non-detects)	A

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

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Chloride	9.9 mg/Kg	6.7 mg/Kg	39 (≤50)	-	-	-
Chlorine	19.8 mg/Kg	13.4 mg/Kg	39 (≤50)	-	-	-
Nitrate as N	0.96 mg/Kg	2.9 mg/Kg	-	1.94 (≤0.20)	J (all detects)	A
Perchlorate	1470 ug/Kg	633 ug/Kg	80 (≤50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Sulfate	233 mg/Kg	8.9 mg/Kg	-	224.1 (≤5.0)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-3	RINSATE-2	Nitrite as N Nitrate as N Orthophosphate	J- (all detects) UJ (all non-detects)	P	Technical holding times
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Chlorate Oil & grease	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	Perchlorate	J (all detects)	A	Field duplicates (RPD)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	Nitrate as N Sulfate	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-03-10'	Orthophosphate as P	5.3U mg/Kg	A
TRNC-D-3	RINSATE-2	Orthophosphate as P	0.50U mg/L	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-03-10'	Orthophosphate as P	5.3U mg/Kg	A

LDC #: 18100C6
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/17/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: [illegible]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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: 11/13-14
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3MS/MSD/Mpo
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(3,4)
X	Field blanks	SW	R=18

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: All soil except # 18, 22, 23 A2

1	TSB-DR-06-0'	11	TSB-DR-04-10'	21	TSB-DR-03-0'DUP	31	
2	TSB-DR-06-10'	12	TSB-CR-04-0'	22	RINSTATE-2MS A2 I	32	
3	TSB-DR-05-0'	13	TSB-CR-04-10'	23	RINSTATE-2DUP	33	
4	TSB-DR-05-0'-FD	14	TSB-CR-05-0'	24	MB	34	
5	TSB-DR-05-10'	15	TSB-CR-05-10'	25		35	
6	TSB-DR-03-0'	16	TSB-CR-06-0'	26		36	
7	TSB-DR-03-10'	17	TSB-CR-06-10'	27		37	
8	TSB-DJ-01-0'	18	RINSTATE-2 A2	28		38	
9	TSB-DJ-01-10'	19	TSB-DR-03-0'MS	29		39	
10	TSB-DR-04-0'	20	TSB-DR-03-0'MSD	30		40	

Notes: _____

LDC #: 18100C6
SDG #: TRNCED-3

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: My
2nd reviewer: R

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-18	Soil/Aq	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] [✓ ClO_4] [✓ O+G/TPH]
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
x 22,23	Aq	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
19,20	Soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
19	↓	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 [✓ O+G/TPH]
19,21	↓	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH

Comments:

LDC #: 18006

SDG #: TRR-D-3

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: MH

2nd reviewer:

All circled dates have exceeded the technical holding time.

(Y) N N/A Were all samples preserved as applicable to each method ?

(Y) N N/A Were all cooler temperatures within validation criteria?

Method:		300.0					
Parameters:		NO_2-N, NO_3-N, o-PO_4-P					
Technical holding time:		48hr					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
18	11/13/07 1450	11/15/07 1803	(51.5 hr)				J-/UJ/R
~2	↓	18=7	(51.5 hr)				↓
23		1815	↓				

LDC #: 18100C6
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: Inorganics, Method Iwi cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/kg

Associated Samples: 0-PO4-P All soil, except 2, 5, 6, 7, 9, 11, 13

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
	MB	mg/L		9								
0-PO4-P	* 2.4	0.252		4.5/5.3								
Cl		0.113										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100c6
SDG #: TRIVc-b-3

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MH
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See comment

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Were all samples associated with a given method blank?
Y N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/L **Associated Samples:** All Aq

Analyte	Blank ID	Maximum ICB/CCB mg/L	Blank Action Limit	Sample Identification								
	MB			18								
orPO4-P	1.1	1.05	5.5	0.47 / 0.50								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18066
SDG #: TRNC-D-3

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See cover

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Blank units: mg/L **Associated sample units:** mg/kg
Sampling date: 1/13/07 Soil factor applied _____
Field blank type: (circle one) Field Blank / (Rinsate) / Other: _____ Associated Samples: BM SO1

Analyte	Blank ID	Blank Action Limit	Sample Identification									
	18		7									
o-PO4-P	0.47		4.5/5.3									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____ Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Analyte	Blank ID	Blank Action Limit	Sample Identification									

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".

LDC #: 18100 C6
SDG #: TRIP-03

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: Inorganics, Method See comm

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	19	Soil	chloride	74	All Soil	J- /UJ/A
			NO_3-N	0		J- /R/A
			o+G	61		J- /UJ/A

Comments: ~~1~~ SO4 74% spike

LDC#: 18100C6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	3	4				
Chloride	9.9	6.7	39			
Chlorine	19.8	13.4	39			
Nitrate as N	0.96	2.9		1.94	(≤0.20)	J det / A
Perchlorate (ug/Kg)	1470	633	80			J det / A
Sulfate	233	8.9		224.1	(≤5.0)	J det / A

V:\FIELD DUPLICATES\FD_inorganic\18100C6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 18, 2008

Matrix: Soil

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW DITCH01-0'
JB-NW DITCH01-10'
TSB-FR-01-0'MS
TSB-FR-01-0'MSD
TSB-FR-01-0'DUP

Introduction

This data review covers 19 soil 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 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
MB	Orthophosphate as P	1.8 mg/Kg	All samples in SDG TRNC-D-4
ICB/CCB	Orthophosphate as P	0.342 mg/L	All samples in SDG TRNC-D-4
ICB/CCB	Chloride	0.031 mg/L	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-10'

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
TSB-DR-01-0'	Orthophosphate as P	4.5 mg/Kg	5.1U mg/Kg

No field blanks were identified in this SDG.

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-FR-01-0'MS (All samples in SDG TRNC-D-4)	Nitrate as N Sulfate	233 (75-125) 135 (75-125)	- -	- -	J+ (all detects) J+ (all detects)	A

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

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Chlorate	32.3 mg/Kg	41.0 mg/Kg	24 (≤50)	-	-	-
Chloride	1790 mg/Kg	2630 mg/Kg	38 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Chlorine	3580 mg/Kg	5260 mg/Kg	38 (≤50)	-	-	-
Fluoride	1.1 mg/Kg	0.44 mg/Kg	-	0.66 (≤1.0)	-	-
Nitrate as N	57.4 mg/Kg	95.2 mg/Kg	50 (≤50)	-	-	-
Perchlorate	168000 ug/Kg	9990 ug/Kg	178 (≤50)	-	J (all detects)	A
Sulfate	150 mg/Kg	553 mg/Kg	115 (≤50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Chloride	25.7 mg/Kg	23.1 mg/Kg	11 (≤50)	-	-	-
Chlorine	51.4 mg/Kg	46.2 mg/Kg	11 (≤50)	-	-	-
Nitrate as N	1.2 mg/Kg	1.0 mg/Kg	18 (≤50)	-	-	-
Perchlorate	92.1 ug/Kg	40.0 ug/Kg	-	52.1 (≤80.7)	-	-
Sulfate	165 mg/Kg	99.8 mg/Kg	49 (≤50)	-	-	-

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Nitrate as N Sulfate	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Perchlorate Sulfate	J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-4	TSB-DR-01-0'	Orthophosphate as P	5.1U mg/Kg	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D6
SDG #: TRNC-D-4
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/17/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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	A	Sampling dates: 11/14/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD/DUP
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(5,6) (12,14)
X	Field blanks	N	

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: Soil

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21		31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22		32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17	TSB-FR-01-0'MS	27		37	
8	TSB-FJ-05-0'	18	TSB-FR-01-0'MSD	28		38	
9	TSB-FJ-05-10'	19	TSB-FR-01-0'DUP	29		39	
10	TSB-DR-01-0'	20	MB	30		40	

Notes:

LDC #: 18006b
SDG #: TRNCED-4

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-16	soil	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO$_3$] [✓ NO$_2$] [✓ SO$_4$] [✓ O-PO$_4$] [✓ Chlorate] [✓ ClO$_4$] [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
~17,18	soil	Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate [✓ ClO$_4$] O+G/TPH
J17,19	✓	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO$_3$] [✓ NO$_2$] [✓ SO$_4$] [✓ O-PO$_4$] [✓ Chlorate] ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH
		Br Bromine Cl Chlorine F NO$_3$ NO$_2$ SO$_4$ O-PO$_4$ Chlorate ClO$_4$ O+G/TPH

Comments:

LDC #: 18100D6
SDG #: TRNC-D-4

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Were all samples associated with a given method blank?
Y N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/kg

Associated Samples: ~~MK-001~~ o-PO4-P: All, Cl: 1,2,4-9,11

Analyte	Blank ID	Maximum ICB/CCB mg/L	Blank Action Limit	Sample Identification								
	MB			10								
o-PO4-P	1.8	0.342		4.5/5.1								
Cl		0.031										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100D6
SDG #: TRNC-D-4

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	17	Soil	NO_3-N	233	All	J+ UJ/A
			SO4	135		J+ UJ/A

Comments: Cl, NO_3-N 74%

MS.6

LDC#: 18100D6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: LC
2nd Reviewer: [signature]

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	5	6				
Chlorate	32.3	41.0	24			
Chloride	1790	2630	38			
Chlorine	3580	5260	38			
Fluoride	1.1	0.44		0.66	(≤1.0)	
Nitrate as N	57.4	95.2	50			
Perchlorate (ug/Kg)	168000	9990	178			J det / A
Sulfate	150	553	115			J det / A

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	12	14				
Chloride	25.7	23.1	11			
Chlorine	51.4	46.2	11			
Nitrate as N	1.2	1.0	18			
Perchlorate (ug/Kg)	92.1	40.0		52.1	(≤80.7)	
Sulfate	165	99.8	49			

LDC Report# 18100E6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 21, 2008

Matrix: Soil/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-10'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD
TSB-FR-02-0'DUP
RINSATE-3MS
RINSATE-3DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 19 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 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 with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/16/07	CCV	Orthophosphate as P	113.0 (90-110)	All water samples in SDG TRNC-D-5	J+ (all detects)	P

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	Concentration	Associated Samples
MB	Orthophosphate as P	1.1 mg/L	All water samples in SDG TRNC-D-5
ICB/CCB	Orthophosphate as P	1.525 mg/L	All water samples in SDG TRNC-D-5
ICB/CCB	Orthophosphate as P	0.309 mg/Kg	All soil samples in SDG TRNC-D-5

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

Sample RINSATE-3 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-3	11/15/07	Fluoride	0.11 mg/L	All samples in SDG TRNC-D-5

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-FJ-03-10'**	Fluoride	1.1 mg/Kg	1.1J+ mg/Kg
TSB-FJ-10-0'**	Fluoride	0.58 mg/Kg	1.1U mg/Kg
TSB-FJ-02-0'**	Fluoride	0.76 mg/Kg	1.1U mg/Kg
TSB-FJ-02-0'-FD**	Fluoride	0.92 mg/Kg	1.0U mg/Kg
TSB-FJ-02-10'**	Fluoride	0.28 mg/Kg	1.1U mg/Kg
TSB-FR-02-0'**	Fluoride	0.90 mg/Kg	1.0U mg/Kg
TSB-FR-02-10'**	Fluoride	1.9 mg/Kg	1.9J+ mg/Kg
TSB-FJ-09-0'**	Fluoride	2.4 mg/Kg	2.4J+ mg/Kg
TSB-FR-03-0'**	Fluoride	0.42 mg/Kg	1.0U 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
RINSATE-3MS (All water samples in SDG TRNC-D-5)	Orthophosphate as P	136 (75-125)	-	-	J+ (all detects)	A
TSB-FR-02-0'MS (All soil samples in SDG TRNC-D-5)	Nitrite as N	0 (75-125)	-	-	J- (all detects) R (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-FR-02-0'MS (All soil samples in SDG TRNC-D-5)	Oil & grease	43 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Sulfate	61 (75-125)	-	-	J- (all detects) UJ (all non-detects)	

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Chlorate	3.8 mg/Kg	8.2 mg/Kg	-	4.4 (≤5.3)	-	-
Chloride	318 mg/Kg	491 mg/Kg	43 (≤50)	-	-	-
Chlorine	637 mg/Kg	981 mg/Kg	43 (≤50)	-	-	-
Nitrate as N	10.2 mg/Kg	15.4 mg/Kg	41 (≤50)	-	-	-
Perchlorate	36500 ug/Kg	226 ug/Kg	198 (≤50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Sulfate	600 mg/Kg	904 mg/Kg	40 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'**	TSB-FJ-02-0'-FD**				
Chlorate	119 mg/Kg	166 mg/Kg	33 (≤50)	-	-	-
Chloride	2840 mg/Kg	3270 mg/Kg	14 (≤50)	-	-	-
Chlorine	5670 mg/Kg	6540 mg/Kg	14 (≤50)	-	-	-
Fluoride	0.73 mg/Kg	0.92 mg/Kg	-	0.19 (≤1.0)		-
Nitrate as N	133 mg/Kg	184 mg/Kg	32 (≤50)	-	-	-
Perchlorate	107000 ug/Kg	3000 ug/Kg	189 (≤50)	-	J (all detects)	A
Sulfate	101 mg/Kg	114 mg/Kg	12 (≤50)	-	-	-

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-5	RINSATE-3	Orthophosphate as P	J+ (all detects)	P	Calibration (CCV %R)
TRNC-D-5	RINSATE-3	Orthophosphate as P	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-0'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** TSB-FR-03-10'**	Oil & grease Sulfate	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	Perchlorate	J (all detects) UJ (all non-detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-03-10'**	Fluoride	1.1J+ mg/Kg	A
TRNC-D-5	TSB-FJ-10-0'**	Fluoride	1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'**	Fluoride	1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Fluoride	1.0U mg/Kg	A
TRNC-D-5	TSB-FJ-02-10'**	Fluoride	1.1U mg/Kg	A
TRNC-D-5	TSB-FR-02-0'**	Fluoride	1.0U mg/Kg	A
TRNC-D-5	TSB-FR-02-10'**	Fluoride	1.9J+ mg/Kg	A
TRNC-D-5	TSB-FJ-09-0'**	Fluoride	2.4J+ mg/Kg	A
TRNC-D-5	TSB-FR-03-0'**	Fluoride	1.0U mg/Kg	A

LDC #: 18100E6
SDG #: TRNC-D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/21/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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	A	Sampling dates: ~~11/15~~ 11/15 07
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/Dup
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1, 2) (8, 9)
X	Field blanks	SW	R=17

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

All soil except #17, 21, 22 A1

1	TSB-FJ-03-0'**	11	TSB-FR-02-0'**	21	RINSATE-3MS A1	31	
2	TSB-FJ-03-0'-FD**	12	TSB-FR-02-10'**	22	RINSATE-3DUP V	32	
3	TSB-FJ-03-10'**	13	TSB-FJ-09-0'**	23	MB	33	
4	TSB-FJ-10-0'**	14	TSB-FJ-09-10'**	24		34	
5	TSB-FJ-10-10'**	15	TSB-FR-03-0'**	25		35	
6	TSB-FJ-04-0'**	16	TSB-FR-03-10'**	26		36	
7	TSB-FJ-04-10'**	17	RINSATE-3 A2	27		37	
8	TSB-FJ-02-0'**	18	TSB-FR-02-0'MS	28		38	
9	TSB-FJ-02-0'-FD**	19	TSB-FR-02-0'MSD	29		39	
10	TSB-FJ-02-10'**	20	TSB-FR-02-0'DUP	30		40	

Notes: _____

LDC #: 18100Eb
SDG #: TRNC-0-5

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: [illegible]

Method: Inorganics (EPA Method See cover

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
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)	✓			
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. Matrix spike/Matrix spike duplicates and 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.		✓		
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.	✓			
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% (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 #: 18160Z6
SDG #: TRWC-05

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	~			
Were detection limits < RL?	~			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

LDC #: 18006b
SDG #: TRNCED 5

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-17	Soil/Aq	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] [✓ ClO_4] [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
21,22	Aq	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
18,19	Soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
18,20		[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
18		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH

Comments:

LDC #: 18100266
SDG #: TRNC65

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: VV
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See cover

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

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
Y N N/A Are all correlation coefficients ≥0.995 ?

LEVEL IV/D ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	11/16/07	CCV	O-PO4-P	113.0	All AA	J+ UJ/P

Comments:

LDC #: 18107B6
SDG #: TRMC-65

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MM
2nd Reviewer:

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: ug/L

Associated Samples: All Aq (ND)

Analyte	Blank ID	Maximum ICB/CCB ug/L	Blank Action Limit	Sample Identification								
	MB											
O-P04-P	1.1	1.5	~~1.5~~ 11									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18002b
SDG #: TRJC1-I

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(N) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: ug/L

Associated Samples: All Sai (ND or >RL)

Analyte	Blank ID	Maximum ICB/CCB ug/L	Blank Action Limit	Sample Identification								
0.004-P		0.309										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18026
SDG #: TRNC05

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See comm

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/Kg
Sampling date: 11/15/07 Soil factor applied 10X
Field blank type: (circle one) Field Blank / (Rinsate) / Other:_____ Associated Samples: All Soil

Analyte	Blank ID	Blank Action Limit	Sample Identification									
	17		3	4	8	9	10	11	12	13	15	
F	0.11	11	1.1J+	0.58/1.1	0.76/1.1	0.92/1.0	0.78/1.1	0.90/1.0	1.9J+	2.4J+	0.42/1.0	

Blank units:_____ **Associated sample units:**_____
Sampling date:_____ Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other:_____ Associated Samples:_____

Analyte	Blank ID	Blank Action Limit	Sample Identification									

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".

LDC #: 18006b

SDG #: TRNC-05

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	21	Aq	o-PO4-P	136	A1 A2	J+ UJ/A
2	18	Soil	NO2-N	0	A1 Soil	J-/R/A
			o+G	43		J-/UJ/A
			Soil	61	↓	↓

Comments: 2. NO3-N 7 4X

MS.6

LDC#: 18100E6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	1	2				
Chlorate	3.8	8.2		4.4	(≤5.3)	
Chloride	318	491	43			
Chlorine	637	981	43			
Nitrate as N	10.2	15.4	41			
Perchlorate (ug/Kg)	36500	226	198			J det / A
Sulfate	600	904	40			

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	8	9				
Chlorate	119	166	33			
Chloride	2840	3270	14			
Chlorine	5670	6540	14			
Fluoride	0.73	0.92		0.19	(≤1.0)	
Nitrate as N	133	184	32			
Perchlorate (ug/Kg)	107000	3000	189			J det / A
Sulfate	101	114	12			

LDC #: 18100-21
SDG #: TRWC-5

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of SO4 was recalculated.Calibration date: 11/16/07

An initial or 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 of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	SO4	s1	500	0.079	*0.9997967*	0.999770	Y
		s2	2000	0.291			
		s3	4000	0.604			
		s4	10000	1.538			
		s5	20000	3.21			
CCV Calibration verification	chloride ~~SO3~~	4.0	4.196		104.9	NR	Y
CCV Calibration verification	orthophosphate	8.0	8.326		104.08	104.07	Y
CCV Calibration verification	ClO4	100	99.907		99.9	NR	Y

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 #: 18500B6
SDG #: TRNC05

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method Gen chem

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

%R = Found / True x 100 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 = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	OTG	1253	1330	94	94	Y
LS	Matrix spike sample	ClO4	(SSR-SR) 107887	102000	1.06	1.05	↓
SD	Duplicate sample	NO3-N	41.8	39.6	5.6	5.6	↓

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 #: 18100B6
SDG #: JRNC95

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MH
2nd reviewer:

METHOD: Inorganics, Method See cover

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

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for 1, 11 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#1. $NO_3\text{-}N = \frac{0.451 \times 40\,ml}{0.00462 \times 4\,g \times 0.95\%} = 102\,\mu g/mg$

$= 10.21\,mg/g$

#	Sample ID	Analyte	Reported Concentration (mg/g)	Calculated Concentration (mg/g)	Acceptable (Y/N)
1	1	Chloride	3.8	3.8	Y
		Cl	318	319	
		Cl ✓	637	638	
		$NO_3\text{-}N$	10.2 ✓	10.2	
		ClO_4 (ug/kg)	36500	36500	
		SO4	600	600	✓
✓	11	Chloride	31.0	31.0	Y
		Cl	1430	1430	
		Cl ✓	2870	2870	
		F	0.90	0.90	
		$NO_3\text{-}N$	39.6	39.6	
		ClO_4 (ug/kg)	59800	59800	
		SO4	55.5	55.5	✓

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 18, 2008

Matrix: Soil/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
TSB-FJ-01-0'DUP
RINSATE-4MS
RINSATE-4DUP

Introduction

This data review covers 18 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 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/17/07	CCV (14:57)	Orthophosphate as P	117.6 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P
11/17/07	CCV (15:59)	Orthophosphate as P	115.8 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P

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	Concentration	Associated Samples
MB	Orthophosphate as P	1.3 mg/L	All water samples in SDG TRNC-D-6
ICB/CCB	Orthophosphate as P	0.948 mg/L	All water samples in SDG TRNC-D-6
MB	Orthophosphate as P	3.2 mg/Kg	All soil samples in SDG TRNC-D-6
ICB/CCB	Orthophosphate as P	0.338 mg/L	All soil samples in SDG TRNC-D-6

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Chloride	0.070 mg/L	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-04-0' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'
ICB/CCB	Perchlorate	0.485 ug/L	TSB-FJ-08-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-GR-01-5' TSB-GJ-06-5' TSB-FJ-01-0'

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
TSB-FR-04-0'	Perchlorate	30.8 mg/Kg	41.5U mg/Kg
TSB-FR-04-0'-FD	Perchlorate	37.9 mg/Kg	43.2U mg/Kg

Sample RINSATE-4 was identified as a rinsate. No contaminant concentrations were found in this blank.

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
RINSATE-4MS (All water samples in SDG TRNC-D-6)	Orthophosphate as P	145 (75-125)	-	-	J+ (all detects)	A
TSB-FJ-01-0'MS (All soil samples in SDG TRNC-D-6)	Nitrite as N	0 (75-125)	-	-	J- (all detects) R (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-FJ-01-0'MS (All soil samples in SDG TRNC-D-6)	Orthophosphate as P	69 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Oil & grease	64 (75-125)	-	-	J- (all detects) UJ (all non-detects)	

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 with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Orthophosphate as P	118 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Chlorate	38.2 mg/Kg	5.4U mg/Kg	-	32.8 (≤5.4)	J (all detects) UJ (all non-detects)	A
Chloride	302 mg/Kg	13.7 mg/Kg	183 (≤50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Chlorine	604 mg/Kg	27.3 mg/Kg	183 (≤50)	-	J (all detects)	A
Fluoride	1.0 mg/Kg	0.27 mg/Kg	-	0.73 (≤1.1)	-	-
Nitrate as N	7.9 mg/Kg	0.74 mg/Kg	-	7.16 (≤0.22)	J (all detects)	A
Perchlorate	30.8 ug/Kg	37.9 ug/Kg	-	7.1 (≤43.2)	-	-
Sulfate	165 mg/Kg	14.8 mg/Kg	-	150.2 (≤5.4)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-6	RINSATE-4	Orthophosphate as P	J+ (all detects)	P	Calibration (CCV %R)
TRNC-D-6	RINSATE-4	Orthophosphate as P	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Orthophosphate Oil & grease	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	RINSATE-4	Orthophosphate as P	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Chlorate	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Chloride Chlorine	J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Nitrate as N Sulfate	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-04-0'	Perchlorate	41.5U mg/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Perchlorate	43.2U mg/Kg	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F6
SDG #: TRNC-D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/18/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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	A	Sampling dates: 11/16/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/Dup
V	Duplicates	A	
VI.	Laboratory control samples	SW	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(5,6)
X	Field blanks	ND	R=16

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: All Soil except #20, 21, 16 A2

1	TSB-FJ-08-0'	11	TSB-GR-01-5'	21	RINSATE-4DUP A2	31	
2	TSB-FJ-08-10'	12	TSB-GJ-06-0'	22	MB	32	
3	TSB-FR-05-0'	13	TSB-GJ-06-5'	23		33	
4	TSB-FR-05-10'	14	TSB-GJ-01-0'	24		34	
5	TSB-FR-04-0'	15	TSB-GJ-01-5'	25		35	
6	TSB-FR-04-0'-FD	16	RINSATE-4 A2	26		36	
7	TSB-FR-04-10'	17	TSB-FJ-01-0'MS	27		37	
8	TSB-FJ-01-0'	18	TSB-FJ-01-0'MSD	28		38	
9	TSB-FJ-01-10'	19	TSB-FJ-01-0'DUP	29		39	
10	TSB-GR-01-0'	20	RINSATE-4MS A2	30		40	

Notes:

LDC #: 18007-6
SDG #: TRNCED-6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-16	Soil/Ar	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] [✓ ClO_4] [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
20,21	Ar	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
17,18	Soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
17,19		[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 [✓ O+G]/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH

Comments:

LDC #: 18100F6
SDG #: TRIC-D-6

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: VV
2nd Reviewer: R

METHOD: Inorganics, EPA Method See cover

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

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
Y N N/A Are all correlation coefficients ≥0.995 ?

LEVEL IV/D ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	11/17/09	ccv (1457)	O-PO4-P	117.6	A11 A12	J+ J+ /p
2	↓	ccv (1559)	O-PO4-P	115.8	↓	↓

Comments:

LDC #: 18100F6
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/L

Associated Samples: All As (CN)

Analyte	Blank ID	Maximum ICB/CCB mg/L	Blank Action Limit	Sample Identification								
	MB											
o-PO4-P	1.3	0.948										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100T6
SDG #: TRIEP-6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/kg **Associated Samples:** 2-pq-P = All Soil, Cl = 1, 2, 5, 8 - 15 (ND or > RL)

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
	MB	mg/kg										
2-pq-P	3.2	0.338										
Cl		0.070										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100T6
SDG #: TRIP-1-6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MY
2nd Reviewer:

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: ug/kg

Associated Samples: 2, 5, 6, ~~X~~, 11, 13, 8

Analyte	Blank ID	Maximum ICB/CCB ug/kg	Blank Action Limit	Sample Identification								
				5		6						
cl04		0.485		30.8/41.5		37.9/43.2						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100F6
SDG #: TRIC-0-6

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	20	AQ	O-PO4-P	145	All AQ	J+ UJ/A
2	17	Soil	~~Cl~~	~~0~~	All Soil	~~J-/R/A~~ (qual Cl + Cl_2)
			~~NO_3-N~~	~~0~~		
			NO_2-N	0		J-/R/A
			~~SO4~~	~~0~~		
			O-PO4-P	69		J-/UJ/A
			D+G	64		

Comments: Cl, NO_3-N, SO4 > 4X

MS.6

LDC #: 18100F6
SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MH
2nd Reviewer: Q

METHOD: Inorganics, Method See cover

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

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?
Y (N) N/A Were all LCS percent recoveries (%R) within the control limits of 80-120% (85-115% for Method 300.0)?

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	Aq	o-PO4-P	118 (90-110)	All Aq	J+ dt /P

Comments:

LCS.6

LDC#: 18100F6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	5	6				
Chlorate	38.2	5.4U		32.8	(≤5.4)	J / UJ / A
Chloride	302	13.7	183			J det / A
Chlorine	604	27.3	183			J det / A
Fluoride	1.0	0.27		0.73	(≤1.1)	
Nitrate as N	7.9	0.74		7.16	(≤0.22)	J det / A
Perchlorate (ug/Kg)	30.8	37.9		7.1	(≤43.2)	
Sulfate	165	14.8		150.2	(≤5.4)	J det / A

V:\FIELD DUPLICATES\FD_inorganic\18100F6.wpd

Revision 1

LDC Report# 18100G6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: March 26, 2008

Matrix: Soil/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD
TSB-GJ-04-0'DUP
RINSATE-5MS
RINSATE-5DUP

Introduction

This data review covers 17 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 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
MB	Orthophosphate as P	0.22 mg/L	All water samples in SDG TRNC-D-7
ICB/CCB	Orthophosphate as P Chloride	0.353 mg/L 0.034 mg/L	All water samples in SDG TRNC-D-7
ICB/CCB	Orthophosphate as P	0.203 mg/L	TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'

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

Sample RINSATE-5 was identified as a rinsate. No contaminant concentrations were found in this blank.

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)	Affected Analyte	Flag	A or P
TSB-GJ-04-0'MS (All soil samples in SDG TRNC-D-7)	Bromide Chlorate Oil & grease Orthophosphate as P	63 (75-125) 64 (75-125) 59 (75-125) 71 (75-125)	- - - -	- - - -	Bromide Bromine Chlorate Oil & grease Orthophosphate as P	J- (all detects) UJ (all non-detects)	A
TSB-GJ-04-0'MS (All soil samples in SDG TRNC-D-7)	Nitrite as N	0 (75-125)	-	-	Nitrite as N	J- (all detects) R (all non-detects)	A

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

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Chlorate	15.5 mg/Kg	13.8 mg/Kg	-	1.7 (≤5.3)	-	-
Chloride	1060 mg/Kg	863 mg/Kg	20 (≤50)	-	-	-
Chlorine	2120 mg/Kg	1730 mg/Kg	20 (≤50)	-	-	-
Nitrate as N	43.1 mg/Kg	36.1 mg/Kg	18 (≤50)	-	-	-
Perchlorate	3760 ug/Kg	13000 ug/Kg	110 (≤50)	-	J (all detects)	A
Sulfate	578 mg/Kg	399 mg/Kg	37 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Chloride	13.4 mg/Kg	3.6 mg/Kg	-	9.8 (≤2.1)	J (all detects)	A
Chlorine	26.8 mg/Kg	7.3 mg/Kg	-	19.5 (≤4.3)	J (all detects)	A
Fluoride	0.26U mg/Kg	0.75 mg/Kg	-	0.49 (≤1.1)	-	-
*Nitrate as N	1.7 mg/Kg	0.52 mg/Kg	-	1.18 (≤0.21)	J (all detects)	A
Perchlorate	779 ug/Kg	477 ug/Kg	48 (≤50)	-	-	-
Sulfate	79.8 mg/Kg	22.1 mg/Kg	-	57.7 (≤5.3)	J (all detects)	A

*Corrected the Difference (Limit) for Nitrate as N in the above table.

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Bromide Bromine Chlorate Oil & grease Orthophosphate as P	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	Perchlorate	J (all detects)	A	Field duplicates (RPD)
TRNC-D-7	TSB-GJ-02-0' TSB-GJ-02-0'-FD	Chloride Chlorine Nitrate as N Sulfate	J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G6
SDG #: TRNC-D-7
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/18/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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	A	Sampling dates: 11/19/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/Dup
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1,2) (6,7)
X	Field blanks	ND	R=15

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: All Soil except # 15, 19, 20 A2

1	TSB-GR-02-0'	11	TSB-GJ-05-0'	21	MB	31	
2	TSB-GR-02-0'-FD	12	TSB-GJ-05-5'	22		32	
3	TSB-GR-02-5'	13	TSB-GJ-03-0'	23		33	
4	TSB-GJ-04-0'	14	TSB-GJ-03-5'	24		34	
5	TSB-GJ-04-5'	15	RINSATE-5 A2	25		35	
6	TSB-GJ-02-0'	16	TSB-GJ-04-0'MS	26		36	
7	TSB-GJ-02-0'-FD	17	TSB-GJ-04-0'MSD	27		37	
8	TSB-GJ-02-5'	18	TSB-GJ-04-0'DUP	28		38	
9	TSB-GJ-07-0'	19	RINSATE-5MS A2	29		39	
10	TSB-GJ-07-5'	20	RINSATE-5DUP	30		40	

Notes:

LDC #: 1810046
SDG #: TRNCZD-7

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-15	soil/Aq	[✓ Br] [✓ Bromine] [✓ Cl] [✓ Chlorine] [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] [✓ ClO_4] O+G/TPH
1-14	soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 [✓ O+G/TPH]
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
19,20	Aq	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
16,18	soil	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ~~ClO_4~~ [✓ O+G/TPH]
16,17	↓	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH
		Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 O+G/TPH

Comments:

LDC #: 18160T6
SDG #: TRNC-07

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/L

Associated Samples: All AA (ND)

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
	MB	mg/L										
OPO4-P	0.22	0.353										
Cl		0.034										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100G6
SDG #: TRMC-V-7

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(N) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/kg

Associated Samples: 9-14 (ND)

Analyte	Blank ID	Maximum ICB/CCB mg/L	Blank Action Limit	Sample Identification								
o-PO4-P		0.203										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18006b
SDG #: TRK09

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A 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.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	16	Soil	Br	63	All Soil	J-/UJ/A (qual Br + Br_2)
			chlorite	64	↓	↓
			NO_2-N	0		J-/R/A
			O+G	59		J-/UJ/A
			O-PO4-P	71	↓	↓

Comments: SO4 > 4X

LDC#: 18100G6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	1	2				
Chlorate	15.5	13.8		1.7	(≤5.3)	
Chloride	1060	863	20			
Chlorine	2120	1730	20			
Nitrate as N	43.1	36.1	18			
Perchlorate (ug/Kg)	3760	13000	110			J det / A
Sulfate	578	399	37			

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	6	7				
Chloride	13.4	3.6		9.8	(≤2.1)	J det / A
Chlorine	26.8	7.3		19.5	(≤4.3)	J det / A
Fluoride	0.26U	0.75		0.49	(≤1.1)	
Nitrate as N	1.7	0.52		1.18	(≤0.25)	J det / A
Perchlorate (ug/Kg)	779	477	48			
Sulfate	79.8	22.1		57.7	(≤5.3)	J det / A

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

GRO

LDC Report# 18100A7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 23, 2008

Matrix: Soil/Water

Parameters: Gasoline Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 13 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 a 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.

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Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

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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 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) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A7
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: JVL
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	A	Sampling dates: 11/09/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 3, 4
X.	Field blanks	ND	R = 12

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: Soil + Water

1	TSB-CR-07-0'	S	11	TSB-CJ-03-10'	S	21	7324075 MB	31	
2	TSB-CR-07-10'		12	RINSATE 1	W	22	7327090 MB	32	
3	TSB-CJ-08-0'		13	TSB-CR-07-0'MS	S	23	7325385 MB	33	
4	TSB-CJ-08-0'-FD		14	TSB-CR-07-0'MSD		24		34	
5	TSB-CJ-08-10'		15	RINSATE 1MS	W	25		35	
6	TSB-CJ-04-0'		16	RINSATE 1MSD		26		36	
7	TSB-CJ-04-10'		17			27		37	
8	TSB-CJ-07-0'		18			28		38	
9	TSB-CJ-07-10'		19			29		39	
10	TSB-CJ-03-0'		20			30		40	

Notes:

LDC Report# 18100B7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 28, 2008

Matrix: Soil

Parameters: Gasoline Range Organics

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'**
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD
TSB-CR-03-0'MS
TSB-CR-03-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 20 soil 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.

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 gasoline range organic contaminants were found in the method blanks.

No field blanks were identified in this SDG.

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
TSB-CJ-06-0'	a,a,a-Trifluorotoluene	48 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

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) and relative percent differences (RPD) 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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0'	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B7
SDG #: TRNC/D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/21/08
Page: 1 of 1
Reviewer: SVL
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	A	Sampling dates: 11/12/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 3, 5 D_2 = 14, 15
X.	Field blanks	N	

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

1	TSB-CJ-02-0'**	11	TSB-CR-03-10'	21	7325385 MB	31	
2	TSB-CJ-02-10'**	12	TSB-CJ-05-0'	22	7331/07 MB	32	
3	TSB-CJ-01-0'** D_1	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10'**	14	TSB-CJ-06-0' D_2	24		34	
5	TSB-CJ-01-0'-FD** D_1	15	TSB-CJ-06-0'-FD D_2	25		35	
6	TSB-CR-02-0'**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'**	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19	TSB-CR-03-0'MS	29		39	
10	TSB-CR-03-0'	20	TSB-CR-03-0'MSD	30		40	

Notes:

LDC #: 18100 B7
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 7
Reviewer: JNC
2nd Reviewer: W

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.	✓			
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%?	✓			
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.		✓		
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?	✓			
VII. 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.	✓			
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?	✓			

LDC #: 18100B7
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: SVG
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 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 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.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 18100B7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVZ
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".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	14	RTX-624	C	48 (70-130)	J-/UJ/A
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18107B7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JB
2nd Reviewer: [illegible]

METHOD: GC / HPLC_____

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

#	Standard ID	Calibration Date	Compound	Reported CF (1.00 std)	Recalculated CF (1.00 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/15/07	Gasoline	18310327	18310327	18426558	18426558	4.475	4.475
	GCL								
2									
3									
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.

LDC #: 18103B7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

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

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	LCAL979B	11/21/07	Low Boiling HC (GRO)	1.000	0.985 ✓	0.985 ✓	1.5	1.5
2								
3								
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.

LDC #: 18100 b7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVB
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TFT	RTX-624	0.0400	0.03767	94	94	0

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
				Reported	Recalculated	

LDC #: 18107b7
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: VK
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

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 Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 19/20

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	0.969	0.962	0	0.889	0.904	92 ✓	92 ✓	94	94	1.7	1.7
Diesel (8015)											
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 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 #: 18100B7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: [illegible]

METHOD: ✓ **GC** __ **HPLC**

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

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7325385 LCS

Compound	Spike Added (mg/kg)		Spiked Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.00	1.00	0.976	0.959	98	98	96	96	1.8	1.8
Diesel (8015)										
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.

LDC #: 18100 B7
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: SM
2nd Reviewer: L

METHOD: ✓ GC ___ HPLC

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

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

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

Example:

Sample ID._____ Compound Name ND

Concentration = _____

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 5, 2008

Matrix: Soil/Water

Parameters: Gasoline Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'
TSB-DR-06-0'RE
TSB-DR-06-10'
TSB-DR-05-0'
TSB-DR-05-0'RE
TSB-DR-05-0'-FD
TSB-DR-05-0'-FDRE
TSB-DR-05-10'
TSB-DR-05-10'RE
TSB-DR-03-0'
TSB-DR-03-10'
TSB-DR-03-10'RE
TSB-DJ-01-0'
TSB-DJ-01-0'RE
TSB-DJ-01-10'
TSB-DJ-01-10'RE
TSB-DR-04-0'
TSB-DR-04-0'RE
TSB-DR-04-10'
TSB-DR-04-10'RE
TSB-CR-04-0'
TSB-CR-04-0'RE
TSB-CR-04-10'
TSB-CR-04-10'RE
TSB-CR-05-0'
TSB-CR-05-0'RE
TSB-CR-05-10'
TSB-CR-05-10'RE
TSB-CR-06-0'
TSB-CR-06-10'
RINSATE-2
TSB-DR-03-0'MS
TSB-DR-03-0'MSD

Introduction

This data review covers 32 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 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 a 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-DR-06-0'RE TSB-DR-05-0'RE TSB-DR-05-0'-FDRE TSB-DR-05-10'RE TSB-DR-03-10'RE	Gasoline range organics	20	14	J- (all detects) UJ (all non-detects)	A
TSB-DJ-01-0'RE TSB-DJ-01-10'RE TSB-DR-04-0'RE TSB-DR-04-10'RE TSB-CR-04-0'RE TSB-CR-04-10'RE TSB-CR-05-10'RE	Gasoline range organics	21	14	J- (all detects) UJ (all non-detects)	A
TSB-CR-05-0'RE	Gasoline range organics	22	14	J- (all detects) UJ (all non-detects)	A

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 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-2" 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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-DR-06-0'	a,a,a-Trifluorotoluene	13 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-06-0'RE	a,a,a-Trifluorotoluene	1.5 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-05-0'	a,a,a-Trifluorotoluene	27 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-05-0'RE	a,a,a-Trifluorotoluene	3.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-05-0'-FD	a,a,a-Trifluorotoluene	8.2 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-05-0'-FDRE	a,a,a-Trifluorotoluene	46 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-05-10'	a,a,a-Trifluorotoluene	64 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-05-10'RE	a,a,a-Trifluorotoluene	23 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-03-10'	a,a,a-Trifluorotoluene	24 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-03-10'RE	a,a,a-Trifluorotoluene	23 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DJ-01-0'	a,a,a-Trifluorotoluene	2.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DJ-01-0'RE	a,a,a-Trifluorotoluene	44 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-DJ-01-10'	a,a,a-Trifluorotoluene	3.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DJ-01-10'RE	a,a,a-Trifluorotoluene	51 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-04-0'	a,a,a-Trifluorotoluene	1.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-04-0'RE	a,a,a-Trifluorotoluene	64 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-04-10'	a,a,a-Trifluorotoluene	2.1 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-04-10'RE	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-04-0'	a,a,a-Trifluorotoluene	4.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-04-0'RE	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-04-10'	a,a,a-Trifluorotoluene	4.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-04-10'RE	a,a,a-Trifluorotoluene	63 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-05-0'	a,a,a-Trifluorotoluene	4.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-05-0'RE	a,a,a-Trifluorotoluene	5.2 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-05-10'	a,a,a-Trifluorotoluene	63 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-05-10'RE	a,a,a-Trifluorotoluene	52 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

b. 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 relative percent differences (RPD) were not within QC limits for the compounds in this SDG, the MS and MSD percent recoveries (%R) were within QC limits and no data were qualified.

c. 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.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD and samples TSB-DR-05-0'RE and TSB-DR-05-0'-FDRE were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0'RE TSB-DR-05-0'RE TSB-DR-05-0'-FDRE TSB-DR-05-10'RE TSB-DR-03-10'RE TSB-DJ-01-0'RE TSB-DJ-01-10'RE TSB-DR-04-0'RE TSB-DR-04-10'RE TSB-CR-04-0'RE TSB-CR-04-10'RE TSB-CR-05-10'RE TSB-CR-05-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-3	TSB-DR-06-0' TSB-DR-05-0' TSB-DR-05-0'-FDRE TSB-DR-05-10' TSB-DR-05-10'RE TSB-DR-03-10' TSB-DR-03-10'RE TSB-DJ-01-0'RE TSB-DJ-01-10'RE TSB-DR-04-0'RE TSB-DR-04-10'RE TSB-CR-04-0'RE TSB-CR-04-10'RE TSB-CR-05-10' TSB-CR-05-10'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-3	TSB-DR-06-0'RE TSB-DR-05-0'RE TSB-DR-05-0'-FD TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-0'RE	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

LDC #: 18100C7 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: TRNC-D-3 Level III Page: 1 of 1
Laboratory: Test America Reviewer: SVC
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	SW	Sampling dates: 11/13/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	(TRNC-D-1) FK120191-01, FK130262-01 (TRNC-D-2)
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 4,6 D_2 = 5,7
X.	Field blanks	ND	R = 31

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: soil + water

1	TSB-DR-06-0'	S	11	TSB-DR-03-10'	S	21	TSB-CR-04-0'	S	31	RINSATE-2	W
2	TSB-DR-06-0'RE		12	TSB-DR-03-10'RE		22	TSB-CR-04-0'RE		32	TSB-DR-03-0'MS	S
3	TSB-DR-06-~~40~~ 10'		13	TSB-DJ-01-0'		23	TSB-CR-04-10'		33	TSB-DR-03-0'MSD	
4	TSB-DR-05-0' D_1		14	TSB-DJ-01-0'RE		24	TSB-CR-04-10'RE		34	7331107 MB	
5	TSB-DR-05-0'RE D_2		15	TSB-DJ-01-10'		25	TSB-CR-05-0'		35	7338144 MB	
6	TSB-DR-05-0'-FD D_1		16	TSB-DJ-01-10'RE		26	TSB-CR-05-0'RE		36	7332310 MB	
7	TSB-DR-05-0'-FDRE D_2		17	TSB-DR-04-0'		27	TSB-CR-05-10'		37	7338421 MB	
8	TSB-DR-05-10'		18	TSB-DR-04-0'RE		28	TSB-CR-05-10'RE		38	7339111 MB	
9	TSB-DR-05-10'RE		19	TSB-DR-04-10'		29	TSB-CR-06-0'		39	7332313 MB	
10	TSB-DR-03-0'		20	TSB-DR-04-10'RE		30	TSB-CR-06-10'		40	7327090 MB	

Notes:

LDC #: 18100 C7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2,5,7,9,12	S	N	11/13/07	—	12/03/07	20	J-/UJ/A
14,16,18,20,				—	12/04/07	21	J-/UJ/A
22,24,28							
26					12/05/07	22	

TECHNICAL HOLDING TIME CRITERIA

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

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100C4
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: JV6
2nd Reviewer: [illegible]

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".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	FID	C	13 (70 - 130)	J- / UJ / A
				( )	
	2			1.5 ( )	J- / R / A
				( )	
	4			27 ( )	J- / UJ / A
				( )	
	5			3.8 ( )	J- / R / A
				( )	
	6			8.2 ( )	J- / R / A
				( )	
	7			46 ( )	J- / UJ / A
				( )	
	8			64 ( )	
				( )	
	9			23 ( )	
				( )	
	11			24 ( )	
				( )	
	12			23 ( )	
				( )	
	13			2.9 ( )	J- / R / A

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 18100 C7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: SVZ
2nd Reviewer: [illegible]

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".
Y N N/A Were surrogates spiked into all samples and blanks?
Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	14	FID	C	44 (70-130)	J- / UJ / A
				( )	
	15			3.3 ( )	J- / R / A
				( )	
	16			51 ( )	J- / UJ / A
				( )	
	17			1.6 ( )	J- / R / A
				( )	
	18			64 ( )	J- / UJ / A
				( )	
	19			2.1 ( )	J- / R / A
				( )	
	20			11 ( )	J- / UJ / A
				( )	
	21			4.3 ( )	J- / R / A
				( )	
	22			11 ( )	J- / UJ / A
				( )	
	23			4.0 ( )	J- / R / A
				( )	
	24	↓	↓	63 (✓)	J- / UJ / A

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 18100C7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: JVC
2nd Reviewer: L

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".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	25	FID	C	4.6 (70-130)	J- / R / A
				( )	
	26			5.2 ( )	
				( )	
	27			63 ( )	J- / UJ / A
				( )	
	28			52 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 18100C7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: [✓ GC] __ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	32/33	GRO	( )	( )	32 (30)	10	No qual
			( )	( )	( )		(MS/MSD in)
			( )	( )	( )		
			( )	( )	( )		
	F7K150237-001	GRO	12 (26-113)	11 (26-113)	( )	None	No qual
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC Report# 18100D7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 23, 2008

Matrix: Soil

Parameters: Gasoline Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FR-01-10'RE
TSB-FJ-07-0'
TSB-FJ-07-0'RE
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'RE
TSB-FJ-06-0'-FD
TSB-FJ-06-0'-FDRE
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-0'RE
TSB-FJ-05-10'
TSB-FJ-05-10'RE
TSB-DR-01-0'
TSB-DR-01-0'RE
TSB-DR-01-10'
TSB-DR-01-10'RE
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-10'RE
TSB-DR-02-0'-FD
TSB-DR-02-0'-FDRE
JB-NW-DITCH01-0'
JB-NW-DITCH01-0'RE
JB-NW-DITCH01-10'
TSB-FR-01-0'MS
TSB-FR-01-0'MSD

Introduction

This data review covers 29 soil 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 a 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.

Raw data were not reviewed for this SDG. The review was 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.

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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 Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FR-01-10'RE TSB-FJ-07-0'RE TSB-FJ-06-0'RE TSB-FJ-06-0'-FDRE TSB-FJ-05-0'RE TSB-FJ-05-10'RE TSB-DR-01-0'RE	Gasoline range organics	20	14	J- (all detects) UJ (all non-detects)	A
TSB-DR-01-10'RE TSB-DR-02-10'RE TSB-DR-02-0'-FDRE JB-NW-DITCH01-0'RE	Gasoline range organics	21	14	J- (all detects) UJ (all non-detects)	A

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 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.

No field blanks were identified in this SDG.

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
TSB-FR-01-10'	a,a,a-Trifluorotoluene	2.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-01-10'RE	a,a,a-Trifluorotoluene	13 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-07-0'	a,a,a-Trifluorotoluene	25 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-07-0'RE	a,a,a-Trifluorotoluene	2.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-06-0'	a,a,a-Trifluorotoluene	13 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-06-0'RE	a,a,a-Trifluorotoluene	30 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-06-0'-FD	a,a,a-Trifluorotoluene	18 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-06-0'-FDRE	a,a,a-Trifluorotoluene	4.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-05-0'	a,a,a-Trifluorotoluene	35 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-05-0'RE	a,a,a-Trifluorotoluene	39 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-05-10'	a,a,a-Trifluorotoluene	2.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-05-10'RE	a,a,a-Trifluorotoluene	14 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-01-0'	a,a,a-Trifluorotoluene	37 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-DR-01-0'RE	a,a,a-Trifluorotoluene	5.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-01-10'	a,a,a-Trifluorotoluene	23 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-01-10'RE	a,a,a-Trifluorotoluene	15 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-02-10'	a,a,a-Trifluorotoluene	37 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-02-10'RE	a,a,a-Trifluorotoluene	67 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-02-0'-FD	a,a,a-Trifluorotoluene	6.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-02-0'-FDRE	a,a,a-Trifluorotoluene	6.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
JB-NW-DITCH01-0'	a,a,a-Trifluorotoluene	60 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
JB-NW-DITCH01-0'RE	a,a,a-Trifluorotoluene	31 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

b. 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 the compounds in this SDG, the LCS percent recoveries (%R) were within QC limits and no data were qualified.

c. 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.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD, samples TSB-FJ-06-0'RE and TSB-FJ-06-0'-FDRE, samples TSB-DR-02-0' and TSB-DR-02-0'-FD, and samples TSB-DR-02-0' and TSB-DR-02-0'-FDRE were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-10'RE TSB-FJ-07-0'RE TSB-FJ-06-0'RE TSB-FJ-06-0'-FDRE TSB-FJ-05-0'RE TSB-FJ-05-10'RE TSB-DR-01-0'RE TSB-DR-01-10'RE TSB-DR-02-10'RE TSB-DR-02-0'-FDRE JB-NW-DITCH01-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-4	TSB-FR-01-10' TSB-FJ-07-0'RE TSB-FJ-06-0'-FDRE TSB-FJ-05-10' TSB-DR-01-0'RE TSB-DR-02-0'-FD TSB-DR-02-0'-FDRE	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-4	TSB-FR-01-10'RE TSB-FJ-07-0' TSB-FJ-06-0' TSB-FJ-06-0'RE TSB-FJ-06-0'-FD TSB-FJ-05-0' TSB-FJ-05-0'RE TSB-FJ-05-10'RE TSB-DR-01-0' TSB-DR-01-10' TSB-DR-01-10'RE TSB-DR-02-10' TSB-DR-02-10'RE JB-NW-DITCH01-0' JB-NW-DITCH01-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D7 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: TRNC-D-4 Level III Page: 1 of 1
Laboratory: Test America Reviewer: JV
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	SW	Sampling dates: 11/14/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K160235-011 (TRNC-D-5)
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 7, 9 D_2 = 8, 10 D_3 = 20, 23 D_4 = 20, 24
X.	Field blanks	N	

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: Soil

1 1	TSB-FR-01-0'	11 1	TSB-FJ-06-10'	21 4	TSB-DR-02-10'	31 1	7332312 MB 11/27
2 1	TSB-FR-01-10'	12 1	TSB-FJ-05-0'	22 3	TSB-DR-02-10'RE	32 4	7338421 MB 12/04
3 2	TSB-FR-01-10'RE	13 2	TSB-FJ-05-0'RE	23 4	TSB-DR-02-0'-FD D_3	33 3	7339111 MB 12/05
4 1	TSB-FJ-07-0'	14 1	TSB-FJ-05-10'	24 3	TSB-DR-02-0'-FDRE D_4	34 4	7332316 MB 11/28
5 2	TSB-FJ-07-0'RE	15 2	TSB-FJ-05-10'RE	25 9	JB-NW-DITCH01-0'	35	
6 1	TSB-FJ-07-10'	16 1	TSB-DR-01-0'	26 3	JB-NW-DITCH01-0'RE	36	
7 1	TSB-FJ-06-0' D_1	17 2	TSB-DR-01-0'RE	27 4	JB-NW-DITCH01-10'	37	
8 2	TSB-FJ-06-0'RE D_2	18 1	TSB-DR-01-10'	28 1	TSB-FR-01-0'MS	38	
9 1	TSB-FJ-06-0'-FD D_1	19 3	TSB-DR-01-10'RE	29 1	TSB-FR-01-0'MSD	39	
10 2	TSB-FJ-06-0'-FDRE D_2	20 1	TSB-DR-02-0' D_3, D_4	30		40	

Notes:

LDC #: 18100 D7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JG
2nd Reviewer:

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD: ✓ GC __ HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
3, 5, 8, 10, 13,	S	N	11/14/07	-	12/04/07	20	J-/UJ/A
15, 17	↓	↓	↓				↓
19, 22, 24, 26	↓	↓	↓	-	12/05/07	21	

TECHNICAL HOLDING TIME CRITERIA

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

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100 D7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 2
Reviewer: JVG
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".
(Y) N N/A Were surrogates spiked into all samples and blanks?
Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ (Column)	Surrogate Compound	%R (Limits)	Qualifications
	2	RTX-624	C	2.9 (70 - 130)	J- /R /A
				( )	
	3			13 ( )	J- /nJ /A
				( )	↓
	4			25 ( )	
				( )	
	5			2.6 ( )	J- /R /A
				( )	
	7			13 ( )	J- /nJ /A
				( )	↓
	8			30 ( )	
				( )	
	9			18 ( )	↓
				( )	
	10			4.6 ( )	J- /R /A
				( )	
	12			35 ( )	J- /nJ /A
				( )	↓
	13			39 ( )	
				( )	
	14	↓	↓	2.3 (↓)	J- /R /A

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100D7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 2 of 2
Reviewer: JVG
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".
(Y) N N/A Were surrogates spiked into all samples and blanks?
Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ (Column)	Surrogate Compound	%R (Limits)	Qualifications
	15	RTX-624	C	14 (70-130)	J-/UJ/A
				( )	
	16			37 ( )	↓
				( )	
	17			5.8 ( )	J-/R/A
				( )	
	18			23 ( )	J-/UJ/A
				( )	
	19			15 ( )	
				( )	
	21			37 ( )	
				( )	
	22			67 ( )	↓
				( )	
	23			6.6 ( )	J-/R/A
				( )	
	24			6.8 ( )	↓
				( )	
	25			60 ( )	J-/UJ/A
				( )	
	26	↓	✓	31 (✓)	↓

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100 D7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

METHOD: ✓ GC ___ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	28/29	GRO	12 (26-113)	11 (26-113)	( )	1	No qual
			( )	( )	( )		(LCS in)
			( )	( )	( )		
			( )	( )	( )		
	F7K160235-011	GRO	18 (26-113)	( )	114 (30)	None	No qual
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC Report# 18100E7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Gasoline Range Organics

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'RE**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-0'RE**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-0'RE**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'RE**
TSB-FJ-02-0'-FD**
TSB-FJ-02-0'-FDRE**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-0'RE**
TSB-FR-02-10'**
TSB-FR-02-10'RE**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-0'RE**
TSB-FR-03-10'**
TSB-FR-03-10'RE**
RINSATE-3
RINSATE-3RE
TSB-FJ-10-0'MS
TSB-FJ-10-0'MSD
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 29 soil samples and 2 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.

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 Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-03-0'RE** TSB-FJ-10-0'RE** TSB-FJ-04-0'RE** TSB-FJ-02-0'RE** TSB-FJ-02-0'-FDRE** TSB-FR-02-10'RE** TSB-FR-03-0'RE** TSB-FR-03-10'RE**	Gasoline range organics	20	14	J- (all detects) UJ (all non-detects)	A
RINSATE-3RE	Gasoline range organics	16	14	J- (all detects) UJ (all non-detects)	A

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 gasoline range organic contaminants were found in the method blanks.

Samples RINSATE-3 and RINSATE-3RE were identified as rinsates. No gasoline range organic contaminants were found in these blanks.

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
TSB-FJ-03-0'**	a,a,a-Trifluorotoluene	26 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-03-0'RE**	a,a,a-Trifluorotoluene	16 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-10-0'**	a,a,a-Trifluorotoluene	45 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-10-0'RE**	a,a,a-Trifluorotoluene	25 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-04-0'**	a,a,a-Trifluorotoluene	4.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-04-0'RE**	a,a,a-Trifluorotoluene	26 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-02-0'**	a,a,a-Trifluorotoluene	7.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-02-0'RE**	a,a,a-Trifluorotoluene	9.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-02-0'-FD**	a,a,a-Trifluorotoluene	14 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-02-0'-FDRE**	a,a,a-Trifluorotoluene	20 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-02-0'**	a,a,a-Trifluorotoluene	1.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-02-0'RE**	a,a,a-Trifluorotoluene	28 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-02-10'**	a,a,a-Trifluorotoluene	42 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FR-02-10'RE**	a,a,a-Trifluorotoluene	2.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-03-0'**	a,a,a-Trifluorotoluene	25 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-0'RE**	a,a,a-Trifluorotoluene	14 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-10'**	a,a,a-Trifluorotoluene	65 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-10'RE**	a,a,a-Trifluorotoluene	17 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
RINSATE-3	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

b. 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 recovery (%R) was not within QC limits for one compound, the MSD percent recovery (%R) was within QC limits and no data were qualified.

c. 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.

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-03-0'RE** and TSB-FJ-03-0'-FD** were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'RE** TSB-FJ-10-0'RE** TSB-FJ-04-0'RE** TSB-FJ-02-0'RE** TSB-FJ-02-0'-FDRE** TSB-FR-02-10'RE** TSB-FR-03-0'RE** TSB-FR-03-10'RE** RINSATE-3RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-5	TSB-FJ-04-0'** TSB-FJ-02-0'** TSB-FJ-02-0'RE** TSB-FR-02-0'** TSB-FR-02-10'RE**	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'RE** TSB-FJ-10-0'** TSB-FJ-10-0'RE** TSB-FJ-04-0'RE** TSB-FJ-02-0'-FD** TSB-FJ-02-0'-FDRE** TSB-FR-02-0'RE** TSB-FR-02-10'** TSB-FR-03-0'** TSB-FR-03-0'RE** TSB-FR-03-10'** TSB-FR-03-10'RE** RINSATE-3	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E7
SDG #: TRNC/D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/24/08
Page: 1 of 1
Reviewer: SVG
2nd Reviewer: [signature]

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	SW	Sampling dates: 11/15/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	FJK120191-012 (TRNC/D-1)
IVc.	Laboratory control samples	A	LCS ID
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 1, 3 D_2 = 2, 3
X.	Field blanks	ND	R = 26, 27

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 + Water

1	1	TSB-FJ-03-0'**	D_1	S	11	3	TSB-FJ-02-0'**	D_3	S	21	3	TSB-FJ-09-10'**	S	31	1	TSB-FR-02-0'MSD	S	
2	2	TSB-FJ-03-0'RE**	D_2		12	2	TSB-FJ-02-0'RE**	D_4		22	3	TSB-FR-03-0'**		32	1	7332316 MB		11/28
3	1	TSB-FJ-03-0'-FD**	D_1	D_2	13	3	TSB-FJ-02-0'-FD**	D_3		23	2	TSB-FR-03-0'RE**		33	2	7339111 MB		12/05
4	3	TSB-FJ-03-10'**			14	2	TSB-FJ-02-0'-FDRE**	D_4		24	3	TSB-FR-03-10'**		34	3	7333271 MB		11/28
5	3	TSB-FJ-10-0'**			15	3	TSB-FJ-02-10'**			25	2	TSB-FR-03-10'RE**		35	4	7327090 MB		11/23
6	2	TSB-FJ-10-0'RE**			16	1	TSB-FR-02-0'**			26	4	RINSATE-3	W	36	5	7335098 MB		12/07
7	3	TSB-FJ-10-10'**			17	3	TSB-FR-02-0'RE**			27	5	RINSATE-3RE		37				
8	3	TSB-FJ-04-0'**			18	3	TSB-FR-02-10'**			28	3	TSB-FJ-10-0'MS	S	38				
9	2	TSB-FJ-04-0'RE**			19	2	TSB-FR-02-10'RE**			29	3	TSB-FJ-10-0'MSD		39				
10	3	TSB-FJ-04-10'**			20	3	TSB-FJ-09-0'**			30	1	TSB-FR-02-0'MS		40				

Notes: _____

LDC #: 18100 E7
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JW
2nd Reviewer: ✓

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.	✓			
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%?	✓			
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.		✓		
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?	✓			
VII. 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.	✓			
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?	✓			

LDC #: 18100 E7
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JV
2nd Reviewer: [illegible]

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 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 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.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

LDC #: 18108 E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: /GC__ HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2, 6, 9, 12, 14,	S	N	11/15/07	—	12/05/07	20	J- / UJ /A
19, 23, 25.							
27	W	Y	11/15/07	—	~~12/05~~ 12/01/07	16	J- /UJ /A

TECHNICAL HOLDING TIME CRITERIA

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

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100E7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 2
Reviewer: JVC
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".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	RTX-624	C	26 (70-130)	J- / UJ / A
				( )	
	2			16 ( )	
				( )	
	5			45 ( )	
				( )	
	6			25 ( )	
				( )	
	8			4.8 ( )	J- / R / A
				( )	
	9			26 ( )	J- / UJ / A
				( )	
	11			7.0 ( )	J- / R / A
				( )	
	12			9.0 ( )	
				( )	
	13			14 ( )	J- / UJ / A
				( )	
	14			20 ( )	
				( )	
	16			1.9 ( )	J- / R / A

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100 E7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 2 of 2
Reviewer: JVC
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".

Y (N) N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	17	RTX-624	C	28 (70-130)	J- /UJ /A
				( )	
	18			42 ( )	
				( )	
	19			2,3 ( )	J- /R /A
				( )	
	22			25 ( )	J- /UJ A
				( )	
	23			14 ( )	
				( )	
	24			65 ( )	
				( )	
	25			17 ( )	
				( )	
	26			11 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	30/31	GRO	18 (26-113)	( )	114 (30)	16	No qual (MSD in)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 18107 E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC_____HPLC_____

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

#	Standard ID	Calibration Date	Compound	Reported CF (1.0 std)	Recalculated CF (1.0 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/15/07	GRO (Low Boiling HC)	18310327	18310327	18426558	18426558	4.475	4.475
2									
3									
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.

LDC #: 18108 E7
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: ✓

METHOD: GC ✓ HPLC ____

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

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	LCAL 100B	11/28/07	GRO	1.000	0.9723	0.9723	2.8	2.8
2	LCAL 111B	11/29/07		↓	0.8608	0.8608	13.9	13.9
3	LCAL 094B	11/28/07			0.9616	0.9616	3.8	3.8
	LCAL 296B	12/05/07			0.9764	0.9764	2.4	2.4
4								
	LCAL 307B	12/05/07	✓	✓	0.968 ✓	0.968 ✓	3.2	3.2 ✓

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 #: 18100 E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVC
2nd reviewer:

METHOD: (GC) HPLC

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: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TFT	RTX-624	0.04	0.01033 ~~0.03938~~	26	26	0

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
				Reported	Recalculated	

LDC #: 18100E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JTC
2nd Reviewer: [illegible]

METHOD: ✓ GC __HPLC

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 Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(((SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 30/31

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.07	1.01	0	0.1836	0.677	18	18	66	66	114	114
Diesel (8015)											
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 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 #: 18100 E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: SV6
2nd Reviewer: L

METHOD: ✓ GC __HPLC

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

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7333271 LCS

Compound	Spike Added (mg/kg)		Spiked Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.00	NA	6.941	NA	94	94				
Diesel (8015)										
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.

LDC #: 18100 E7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JTL
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

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

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

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

Example:

Sample ID. # 5 Compound Name GRO

Concentration = $\frac{(4925680)\ (5.0\,ml)}{(18426558)\ (5.01\,ml)\ (0.936)} = 0.285 \approx 0.29\ mg/kg$

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Gasoline Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-0'RE
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-0'RE
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-0'-FDRE
TSB-FR-04-10'
TSB-FR-04-10'RE
TSB-FJ-01-0'
TSB-FJ-01-0'RE
TSB-FJ-01-10'
TSB-FJ-01-10'RE
TSB-GR-01-0'
TSB-GR-01-0'RE
TSB-GR-01-5'
TSB-GR-01-5'RE
TSB-GJ-06-0'
TSB-GJ-06-0'RE
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
TSB-GJ-01-5'RE
RINSATE-4
TSB-FJ-08-0'MS
TSB-FJ-08-0'MSD
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD

Introduction

This data review covers 29 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 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.

Raw data were not reviewed for this SDG. The review was 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-08-0'RE TSB-FR-05-0'RE	Gasoline range organics	19	14	J- (all detects) UJ (all non-detects)	A
TSB-FR-04-0'-FDRE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GJ-06-0'RE TSB-GJ-01-5'RE	Gasoline range organics	25	14	J- (all detects) UJ (all non-detects)	A

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 gasoline range organic contaminants were found in the method blanks.

Sample RINSATE-4 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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FJ-08-0'	a,a,a-Trifluorotoluene	50 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-08-0'RE	a,a,a-Trifluorotoluene	2.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-05-0'	a,a,a-Trifluorotoluene	3.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-05-0'RE	a,a,a-Trifluorotoluene	0.64 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-04-0'-FD	a,a,a-Trifluorotoluene	59 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-04-0'-FDRE	a,a,a-Trifluorotoluene	0.39 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-04-10'	a,a,a-Trifluorotoluene	67 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-04-10'RE	a,a,a-Trifluorotoluene	2.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-01-0'	a,a,a-Trifluorotoluene	42 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-01-10'	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GR-01-0'	a,a,a-Trifluorotoluene	8.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GR-01-0'RE	a,a,a-Trifluorotoluene	7.5 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GR-01-5'	a,a,a-Trifluorotoluene	31 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-GJ-06-0'	a,a,a-Trifluorotoluene	7.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GJ-01-5'	a,a,a-Trifluorotoluene	61 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

b. 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 recovery (%R) and MS/MSD relative percent difference (RPD) was not within QC limits for one compound, the MSD percent recovery (%R) was within QC limits and no data were qualified.

c. 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.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD and samples TSB-FR-04-0' and TSB-FR-04-0'-FDRE were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0'RE TSB-FR-05-0'RE TSB-FR-04-0'-FDRE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GJ-06-0'RE TSB-GJ-01-5'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-6	TSB-FJ-08-0'RE TSB-FR-05-0' TSB-FR-05-0'RE TSB-FR-04-0'-FDRE TSB-FR-04-10'RE TSB-GR-01-0' TSB-GR-01-0'RE TSB-GJ-06-0'	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-5' TSB-GJ-01-5'	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F7
SDG #: TRNC/D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/23/08
Page: 1 of 1
Reviewer: SW
2nd Reviewer: V

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	SW	Sampling dates: 11/16/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K120191-01Y (TRNC/D-1); F7K200203-004 (TRNC/D-7)
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 7, 8 D_2 = 7, 9
X.	Field blanks	ND	R = 26

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: Soil + Water

1	1	TSB-FJ-08-0'	S	11	4	TSB-FR-04-10'RE	S	21	4	TSB-GJ-06-0'RE	S	31	1	7333501 MB	11/21
2	4	TSB-FJ-08-0'RE		12	3	TSB-FJ-01-0'		22	5	TSB-GJ-06-5'		32	4	7339111 MB	12/05
3	3	TSB-FJ-08-10'		13	4	TSB-FJ-01-0'RE		23	5	TSB-GJ-01-0'		33	3	7333596 MB	11/20
4	3	TSB-FR-05-0'		14	3	TSB-FJ-01-10'		24	5	TSB-GJ-01-5'		34	4	7343296 MB	12/11
5	4	TSB-FR-05-0'RE		15	4	TSB-FJ-01-10'RE		25	4	TSB-GJ-01-5'RE		35	5	7335097 MB	11/30
6	3	TSB-FR-05-10'		16	3	TSB-GR-01-0'		26	6	RINSATE-4	W	36	6	7327090 MB	11/23
7	3	TSB-FR-04-0'	D_1 D_2	17	4	TSB-GR-01-0'RE		27	1	TSB-FJ-08-0'MS	S	37			
8	3	TSB-FR-07-0'-FD	D_1	18	5	TSB-GR-01-5'		28	1	TSB-FJ-08-0'MSD		38			
9	4	TSB-FR-07-0'-FDRE	D_2	19	4	TSB-GR-01-5'RE		29	3	TSB-FJ-01-0'MS		39			
10	3	TSB-FR-04-10'		20	5	TSB-GJ-06-0'		30	3	TSB-FJ-01-0'MSD		40			

Notes: _____

LDC #: 18100 F7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: JV6
2nd Reviewer: ✓

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD: ✓ GC __ HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2, 5	S	N	11/16/07	—	12/05/07	19	J- / UJ / A
9, 11, 13, 15, 17,	↓	↓	↓	↓	12/11/07	25	↓
19, 21, 25	↓	↓	↓	↓	↓	↓	↓

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:	Water unpreserved:	Aromatic within 7 days, non-aromatic within 14 days of sample collection.
	Water preserved:	Both within 14 days of sample collection.
	Soils:	Both within 14 days of sample collection.
EXTRACTABLES:		
	Water:	Extracted within 7 days, analyzed within 40 days.
	Soil:	Extracted within 14 days, analyzed within 40 days.

LDC #: 18100 F7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 2
Reviewer: JVG
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".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	RTX-624	C	50 (70-130)	J- / UJ / A
	2			2.0 ( )	J- / R / A
	4			3.0 ( )	
	5			0.64 ( )	
	8			59 ( )	J- / UJ / A
	9			0.39 ( )	J- / R / A
	10			67 ( )	J- / UJ / A
	11			2.3 ( )	J- / R / A
	12			42 ( )	J- / UJ / A
	14			11 ( )	
	16			8.9 ( )	J- / R / A

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100F7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 2 of 7
Reviewer: JVC
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".
(Y) N N/A Were surrogates spiked into all samples and blanks?
Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	17	RTX-624	C	7.5 (70-130)	J- /R /A
				( )	
	18			31 ( )	J- /UJ /A
				( )	
	20			7.8 ( )	J- /R /A
				( )	
	24			61 ( )	J- / UJ /A
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100 #7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

METHOD: ✓ GC ___ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	27/28	GRO	12 (26-113)	( )	~~45~~ 110 (30)	1	No qual (MSDi)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Gasoline Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'RE
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GR-02-5'RE
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-04-5'RE
TSB-GJ-02-0'
TSB-GJ-02-0'RE
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-02-5'RE
TSB-GJ-07-0'
TSB-GJ-07-0'RE
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-0'RE
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD
TSB-GJ-07-5'MS
TSB-GJ-07-5'MSD

Introduction

This data review covers 25 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 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.

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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

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Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-GR-02-0'RE TSB-GR-02-5'RE TSB-GJ-04-5'RE TSB-GJ-02-0'RE TSB-GJ-02-5'RE TSB-GJ-07-0'RE TSB-GJ-05-0'RE	Gasoline range organics	22	14	J- (all detects) UJ (all non-detects)	A

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 gasoline range organic contaminants were found in the method blanks.

Sample RINSATE-5 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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-GR-02-0'	a,a,a-Trifluorotoluene	2.5 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GR-02-5'	a,a,a-Trifluorotoluene	42 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-04-5'	a,a,a-Trifluorotoluene	2.4 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GJ-02-0'	a,a,a-Trifluorotoluene	6.4 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GJ-02-5'	a,a,a-Trifluorotoluene	64 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-02-5'RE	a,a,a-Trifluorotoluene	63 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-07-0'	a,a,a-Trifluorotoluene	30 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-05-0'	a,a,a-Trifluorotoluene	36 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-05-0'RE	a,a,a-Trifluorotoluene	3.4 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A

b. 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 relative percent difference (RPD) was not within QC limits for one compound, the MS and MSD percent recoveries (%R) were within QC limits and no data were qualified.

c. 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.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD, samples TSB-GR-02-0'RE and TSB-GR-02-0'-FD, samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD, and samples TSB-GJ-02-0'RE and TSB-GJ-02-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0'RE TSB-GR-02-5'RE TSB-GJ-04-5'RE TSB-GJ-02-0'RE TSB-GJ-02-5'RE TSB-GJ-07-0'RE TSB-GJ-05-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-7	TSB-GR-02-5' TSB-GJ-02-5' TSB-GJ-02-5'RE TSB-GJ-07-0' TSB-GJ-05-0'	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-05-0'RE	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G7
SDG #: TRNC/D-7
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/23/08
Page: 1 of 1
Reviewer: JVG
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	SW	Sampling dates: 11/19/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K120191-012 (TRNC/D-)
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 1, 3 D_2 = 2, 3 D_3 = 9, 11 D_4 = 10, 11
X.	Field blanks	ND	R = 22

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: Soil + Water

1	TSB-GR-02-0' D_1	S	11	TSB-GJ-02-0'-FD D_2, D_3	S	21	3	TSB-GJ-03-5'	S	31	1	7327090 MB	11/20
2	TSB-GR-02-0'RE D_2		12	TSB-GJ-02-5'		22	1	RINSATE-5	W	32	1	7335097 MB	11/20
3	TSB-GR-02-0'-FD D_3, D_4		13	TSB-GJ-02-5'RE		23	2	TSB-GJ-04-0'MS	S	33	3	7336019 MB	12/6
4	TSB-GR-02-5'		14	TSB-GJ-07-0'		24	2	TSB-GJ-04-0'MSD		34	4	7345296 MB	12/11
5	TSB-GR-02-5'RE		15	TSB-GJ-07-0'RE		25	3	TSB-GJ-07-5'MS		35			
6	TSB-GJ-04-0'		16	TSB-GJ-07-5'		26	3	TSB-GJ-07-5'MSD		36			
7	TSB-GJ-04-5'		17	TSB-GJ-05-0'		27				37			
8	TSB-GJ-04-5'RE		18	TSB-GJ-05-0'RE		28				38			
9	TSB-GJ-02-0' D_3		19	TSB-GJ-05-5'		29				39			
10	TSB-GJ-02-0'RE D_4		20	TSB-GJ-03-0'		30				40			

Notes:

LDC #: 18100 G7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: JVG
2nd Reviewer: L

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2, 5, 8, 10, 13,	S	N	11/19/07	-	12/11/07	22	J-/UJ/A
15, 18.							

TECHNICAL HOLDING TIME CRITERIA

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

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18100G7
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVG
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".
Y/N N/A Were surrogates spiked into all samples and blanks?
Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	RTX-624	C	2.5 (70 - 130)	J- /R /A
				( )	
	4			42 ( )	J- /UJ /A
				( )	
	7			2.4 ( )	J- /R /A
				( )	
	9			6.4 ( )	
				( )	
	12			64 ( )	J- /UJ /A
				( )	
	13			63 ( )	
				( )	
	14			30 ( )	
				( )	
	17			36 ( )	
				( )	
	18			3.4 ( )	J- /R /A
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 18100 G7
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

METHOD: [✓ GC] __ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	23/24	GRO	( )	( )	45 (30)	6	No qual
			( )	( )	( )		(MS/MSD in)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

DRO

LDC Report# 18100A8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 24, 2008

Matrix: Soil/Water

Parameters: Diesel Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
TSB-CJ-04-0'MS
TSB-CJ-04-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 15 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 a 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.

Raw data were not reviewed for this SDG. The review was 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 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 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
7318087MB	ortho-Terphenyl	52 (53-171)	Diesel range organics	J- (all detects) UJ (all non-detects)	P

b. Matrix Spike/Matrix Spike Duplicates

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

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

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A8
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: JVG
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	A	Sampling dates: 11/09/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 3, 4
X.	Field blanks	ND	R = 12

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: soil + water

1	TSB-CR-07-0'	S	11	TSB-CJ-03-10'	S	21	7318066 MB	31	
2	TSB-CR-07-10'		12	RINSATE 1	W	22	7318087 MB	32	
3	TSB-CJ-08-0'		13	TSB-CR-07-0'MS	S	23	7325501 MB	33	
4	TSB-CJ-08-0'-FD		14	TSB-CR-07-0'MSD		24		34	
5	TSB-CJ-08-10'		15	TSB-CJ-04-0'MS		25		35	
6	TSB-CJ-04-0'		16	TSB-CJ-04-0'MSD		26		36	
7	TSB-CJ-04-10'		17	RINSATE 1MS	W	27		37	
8	TSB-CJ-07-0'		18	RINSATE 1MSD		28		38	
9	TSB-CJ-07-10'		19			29		39	
10	TSB-CJ-03-0'		20			30		40	

Notes: _____

LDC #: 18100 A8
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVZ
2nd Reviewer: L

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".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	~~Detector~~ Column	Surrogate Compound	%R (Limits)	Qualifications
	7318087 MB	~~ELD~~ RTX-5	H	52 (53-171)	J- /NJ /P
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 18100A6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: JVG
2nd Reviewer: [signature]

METHOD: ✓ GC ___ HPLC

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?
(Y) N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y (N) N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	15/16	DRO	( )	0 (37-116)	200 (30)	6	No qual (MS in)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC Report# 18100B8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 28, 2008

Matrix: Soil

Parameters: Diesel Range Organics

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil 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 25.0% 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.

No field blanks were identified in this SDG.

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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B8
SDG #: TRNC/D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/21/08
Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [signature]

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	A	Sampling dates: 11/12/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 3, 5 D_2 = 14, 15
X.	Field blanks	N	

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

1	TSB-CJ-02-0'** soil	11	TSB-CR-03-10'	21	7319098 MB	31	
2	TSB-CJ-02-10'**	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0'** D_1	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10'**	14	TSB-CJ-06-0' D_2	24		34	
5	TSB-CJ-01-0'-FD** D_1	15	TSB-CJ-06-0'-FD D_2	25		35	
6	TSB-CR-02-0'**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19		29		39	
10	TSB-CR-03-0'	20		30		40	

Notes: _____

LDC #: 18100b8
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JN
2nd Reviewer: [illegible]

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.	✓			
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%?	✓			
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.		✓		
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?			✓	
VII. 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.	✓			
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?	✓			

LDC #: 18100B8
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JG
2nd Reviewer: V

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 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 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.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 18100 BB
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: NZ
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

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

#	Standard ID	Calibration Date	Compound	Reported CF (1000 std)	Recalculated CF (1000 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/31/07	Diesel	13520	13519.657	13454	13454	3.480	3.479
	GCE								
2									
3									
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.

LDC #: 18108g
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: NC
2nd Reviewer: [signature]

METHOD: GC ✓ HPLC_____

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

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	ECAL069	11/21/07	Diesel	1000	1091.6047	1091.6047	9.2	9.2
2								
3								
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.

LDC #: 18100B2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JV6
2nd reviewer: L

METHOD: / GC ___ HPLC

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: 41

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
O-Terphenyl	RTX-5	25	15.9087	64	64	0

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
				Reported	Recalculated	

LDC #: 18100 B8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JR
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

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 Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 17/18

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	84.7	85.0	0	76.5	74.7	90	90	87	87	3.1	3.1
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 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 #: 18110 B8
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer:

METHOD: ✓ GC __HPLC

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

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7319698 LCS

Compound	Spike Added (mg/kg)		Spiked Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)	83.7	NA	78.3	NA	94	94	—			
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.

LDC #: 18100B8
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: [signature]

METHOD: ✓ GC ___ HPLC

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

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

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

Example:

Sample ID._____ Compound Name MD

Concentration = _____

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

LDC Report# 18100C8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 5, 2008

Matrix: Soil/Water

Parameters: Diesel Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2MS
TSB-DR-06-10'	RINSATE-2MSD
TSB-DR-05-0'	
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

Introduction

This data review covers 19 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 a 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.

Raw data were not reviewed for this SDG. The review was 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 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 diesel range organic contaminants were found in the method blanks.

Sample "RINSATE-2" 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.

b. Matrix Spike/Matrix Spike Duplicates

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

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

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

LDC #: 18100C8
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: JVG
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	A	Sampling dates: 11/13/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 3, 4
X.	Field blanks	ND	R = 18

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: Soil + Water

1	1	TSB-DR-06-0'	S	11	TSB-DR-04-10'	S	21	RINSATE-2MS	W	31	1	7319098	MB
2	1	TSB-DR-06-10'		12	TSB-CR-04-0'		22	RINSATE-2MSD		32	2	7322044	MB
3	1	TSB-DR-05-0'	D	13	TSB-CR-04-10'		23			33	3	7324111	MB
4	1	TSB-DR-05-0'-FD	D	14	TSB-CR-05-0'		24			34			
5		TSB-DR-05-10'		15	TSB-CR-05-10'		25			35			
6		TSB-DR-03-0'		16	TSB-CR-06-0'		26			36			
7		TSB-DR-03-10'		17	TSB-CR-06-10'		27			37			
8		TSB-DJ-01-0'		18	3 RINSATE-2	W	28			38			
9		TSB-DJ-01-10'		19	TSB-DR-03-0'MS	S	29			39			
10		TSB-DR-04-0'		20	TSB-DR-03-0'MSD		30			40			

Notes:

LDC #: 18100 C8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	21/22	DRO	( )	( )	26 (20)	18	No qual
			( )	( )	( )		(MS/MSD in)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 23, 2008

Matrix: Soil

Parameters: Diesel Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'

Introduction

This data review covers 16 soil 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 a 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.

Raw data were not reviewed for this SDG. The review was 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 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 diesel range organic contaminants were found in the method blanks.

No field blanks were identified in this SDG.

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
JB-NW-DITCH01-10'	ortho-Terphenyl	56 (59-164)	Diesel range organics	J- (all detects) UJ (all non-detects)	P

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 not within QC limits. Since there were no associated samples, no data were qualified.

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

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-FJ-06-0'and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	JB-NW-DITCH01-10'	Diesel range organics	J- (all detects) UJ (all non-detects)	P	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D8 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: TRNC-D-4 Level III Page: 1 of 1
Laboratory: Test America Reviewer: SR
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	A	Sampling dates: 11/14/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K160235-011 (TRNC-D-5)
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 5, 6 D_2 = 12, 14
X.	Field blanks	N	

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: Soil

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21	7322044 MB	31	
2	TSB-FR-01-10'	12	TSB-DR-02-0' D_2	22	7324074 MB	32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD D_2	24		34	
5	TSB-FJ-06-0' D_1	15	JB-NW-DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD D_1	16	JB-NW-DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17		27		37	
8	TSB-FJ-05-0'	18		28		38	
9	TSB-FJ-05-10'	19		29		39	
10	TSB-DR-01-0'	20		30		40	

Notes:

LDC #: 18100 D8
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVC
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".

Y N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	16	RTX-5	H	56 (59-164)	J- / UJ / P
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100D8
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

METHOD: ✓ GC ___ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	F7K160235-011	DRO	179 (37–116)	218 (37-116)	( )	None	No qual
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC Report# 18100E8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Diesel Range Organics

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-10'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**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 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-3 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.

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 not within QC limits. Since there were no associated samples, no data were qualified.

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E8
SDG #: TRNC-D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/29/08
Page: 1 of 1
Reviewer: SVL
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	A	Sampling dates: 11/15/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K140171-021 (TRNC/D-3); F7K190148-008 (TRNC/D-6)
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	MD	D1 = 1, 2 D2 = 8, 9
X.	Field blanks	ND	R = 17

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 + Water

1	TSB-FJ-03-0'**	D1 S	11	TSB-FR-02-0'**	S	21	7324074 MB	11/30	31		
2	TSB-FJ-03-0'-FD**	D1	12	TSB-FR-02-10'**		22	7325273 MB	11/31	32		
3	TSB-FJ-03-10'**		13	TSB-FJ-09-0'**		23	7324111 MB	11/30	33		
4	TSB-FJ-10-0'**		14	TSB-FJ-09-10'**		24			34		
5	TSB-FJ-10-10'**		15	TSB-FR-03-0'**		25			35		
6	TSB-FJ-04-0'**		16	TSB-FR-03-10'**		26			36		
7	TSB-FJ-04-10'**		17	RINSATE-3	W	27			37		
8	TSB-FJ-02-0'**	D2	18	TSB-FR-02-0'MS	S	28			38		
9	TSB-FJ-02-0'-FD**	D2	19	TSB-FR-02-0'MSD		29			39		
10	TSB-FJ-02-10'**		20			30			40		

Notes:

LDC #: 18100 E6
SDG #: See Copy

VALIDATION FINDINGS CHECKLIST

Reviewer: JVB
2nd Reviewer: V

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.	✓			
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%?	✓			
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.		✓		
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?			✓	
VII. 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.	✓			
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?	✓			

LDC #: 18150E8
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: JM
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 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 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.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

LDC #: 18100E8
SDG #: See Cover

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

METHOD: ✓ GC ___ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	18/19	DRO	( )	*132 (37-116)	( )	11	No qual
			( )	( )	( )		(MS; LCS in)
			( )	( )	( )		
			( )	( )	( )		
	F7K140171-021	DRO	( )	( )	26 (20)	None	No qual
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

(* value from recalculations; parent conc. not used in calc. from lab)

LDC #: 18100E8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVB
2nd Reviewer:

METHOD: GC ✓ HPLC_____

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

#	Standard ID	Calibration Date	Compound	Reported CF (1000 std)	Recalculated CF (100 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL GCB	11/21/07	Diesel	19777	19777	21081	21081	15.16	15.16
2	ICAL GCE	11/20/07		17911	179 10.768	17675	17675	12.219	12.219
3									
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.

LDC #: 18100 E8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVR
2nd Reviewer:

METHOD: GC / HPLC

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

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	ECAL296	12/07/07	Diesel	1000	1016.0379	1016.0359	1.6	1.6
2	ECAL309	12/07/07			1069.5371	1069.5351	7.0	7.0
3	OCAL485	12/06/07			1078.2174	1078.1919	7.8	7.8
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.

LDC #: 18100E8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JV6
2nd reviewer:

METHOD: ✓ GC ___ HPLC

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: # 1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
O-Terphenyl	RTX-5	25	16.1011	64	64	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 18103E8
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: SVG
2nd Reviewer:

METHOD: ___ GC ___HPLC

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 Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 18 / 19

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	84.3	83.2	66.0	151	176	179	101	212	132	15	15
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 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 #: 18100 E8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: JN
2nd Reviewer: L

METHOD: (GC __HPLC

The percent recoveries (%R) and relative percent differences (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 = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample, LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 7325273 LCS

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	83.3	NA	0	70.0	NA	84	84				
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.

LDC #: 18100 E8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SW
2nd Reviewer:

/

METHOD: ___ GC ___ HPLC

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?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

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

Example:

Sample ID. # 11 Compound Name DRO

Concentration = $\frac{(341\,05719)(1\ ml)}{(17675)(30.1g)(0.976)} = 65.68$

≈ 66 mg/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

SAMPCALew.wpd

LDC Report# 18100F8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Diesel Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD

Introduction

This data review covers 17 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 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.

Raw data were not reviewed for this SDG. The review was 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-4 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. Surrogate recoveries (%R) were not within QC limits for TSB-FR-04-0' and TSB-FR-04-0'-FD. Since the samples were diluted out, no data were qualified.

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 not within QC limits. Since there were no associated samples, no data were qualified.

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

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Diesel range organics	280	5500	-	5220 (≤1100)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Diesel range organics	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F8
SDG #: TRNC/D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/23/08
Page: 1 of 1
Reviewer: SVG
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	A	Sampling dates: 11/16/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K140171-021 (TRNC/D-3)
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 5, 6
X.	Field blanks	ND	R = 16

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: Soil + water

1	TSB-FJ-08-0' S	11	TSB-GR-01-5' S	21	7325273 MB	31	
2	TSB-FJ-08-10'	12	TSB-GJ-06-0'	22	7324111 MB	32	
3	TSB-FR-05-0'	13	TSB-GJ-06-5'	23		33	
4	TSB-FR-05-10'	14	TSB-GJ-01-0'	24		34	
5	TSB-FR-04-0' D	15	TSB-GJ-01-5'	25		35	
6	TSB-FR-04-0'-FD D	16	RINSATE-4 W	26		36	
7	TSB-FR-04-10'	17	TSB-FJ-01-0'MS S	27		37	
8	TSB-FJ-01-0'	18	TSB-FJ-01-0'MSD	28		38	
9	TSB-FJ-01-10'	19		29		39	
10	TSB-GR-01-0'	20		30		40	

Notes:

LDC #: 18100 F8
SDG #: See Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

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".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	5 (20X)	RTX-5	H	DO (59-164)	No qual
		↓	↓	( )	
	6 (20X)	↓	↓	( )	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	Decachlorobiphenyl
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18100 F8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: L

METHOD: [✓ GC] __ HPLC

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?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	F7K140171-021	DRO	( )	( )	26 (20)	None	No qual
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 18100 F8
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVC
2nd reviewer:

METHOD: ✓ GC __ HPLC

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		%RPD	Qualification
	5	6	Limit_____	Parent only / All Samples
DRO	280	5500	5220 (≤ 1100 Diff)	J dets / A

Compound	Concentration ( )		%RPD	Qualification
			Limit _____	Parent only / All Samples

LDC Report# 18100G8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 28, 2008

Matrix: Soil/Water

Parameters: Diesel Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD
RINSATE-5MS
RINSATE-5MSD

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 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.

Raw data were not reviewed for this SDG. The review was 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-5 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. Surrogate recoveries (%R) were not within QC limits for TSB-GJ-03-0'. Since the sample was diluted out, no data were qualified.

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

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G8 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/23/08
SDG #: TRNC-D-7 Level III Page: 1 of 1
Laboratory: Test America Reviewer: JVG
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	A	Sampling dates: 11/19/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D_1 = 1, 2 D_2 = 6, 7
X.	Field blanks	ND	R = 15

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: Soil + Water

1	TSB-GR-02-0'	D_1 S	11	TSB-GJ-05-0'	S	21	7330081 MB	11/26	31
2	TSB-GR-02-0'-FD	D_1	12	TSB-GJ-05-5'		22	7330147 MB	11/26	32
3	TSB-GR-02-5'		13	TSB-GJ-03-0'		23			33
4	TSB-GJ-04-0'		14	TSB-GJ-03-5'		24			34
5	TSB-GJ-04-5'		15	RINSATE-5	W	25			35
6	TSB-GJ-02-0'	D_2	16	TSB-GJ-04-0'MS	S	26			36
7	TSB-GJ-02-0'-FD	D_2	17	TSB-GJ-04-0'MSD		27			37
8	TSB-GJ-02-5'		18	RINSATE-5MS		28			38
9	TSB-GJ-07-0'		19	RINSATE-5MSD		29			39
10	TSB-GJ-07-5'		20			30			40

Notes:

LDC #: 18100G8
SDG #: see Cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

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".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	13 (100x)	RTX-5	H	DD (59-164)	No qual
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100

Dioxins

LDC Report# 18100A21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 9, 2007

LDC Report Date: January 24, 2008

Matrix: Soil/Water

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1

Introduction

This data review covers 11 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.

Raw data were not reviewed for this SDG. The review was 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% .

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.

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 with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
11/29/07	1,2,3,7,8,9-HxCDD	20.5	TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	1,2,3,7,8,9-HxCDD	J- (all detects) UJ (all non-detects)	P

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 with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
7334440MB	11/30/07	OCDD	5.1 pg/g	TSB-CR-07-0' TSB-CJ-07-10'

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated 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:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
732429MB	^{13}C-OCDD	33 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-CR-07-10'	^{13}C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-08-0'	^{13}C-2,3,7,8-TCDF ^{13}C-2,3,7,8-TCDD ^{13}C-1,2,3,7,8-PeCDF ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	28 (40-135) 30 (40-135) 31 (40-135) 36 (40-135) 38 (40-135) 27 (40-135)	2,3,7,8-TCDF 2,3,7,8-TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CJ-08-10'	^{13}C-OCDD	30 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-04-0'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-OCDD	37 (40-135) 18 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CJ-04-10'	^{13}C-OCDD	30 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-07-0'	^{13}C-OCDD	35 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CR-07-0'	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
2,3,7,8-TCDF	2.1	92	191 (≤50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	3.3	210	194 (≤50)	-	J (all detects)	A
1,2,3,4,7,8-HxCDF	5.9	330	193 (≤50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	4.2	250	193 (≤50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	9.9	570	193 (≤50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	4.1	230	193 (≤50)	-	J (all detects)	A
OCDF	21	1100	193 (≤50)	-	J (all detects)	A
2,3,7,8-TCDD	1.0U	2.6	-	1.6 (≤1.0)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
1,2,3,7,8-PeCDD	1.2U	11	-	9.8 (≤1.2)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	0.63U	6.8	-	6.17 (≤0.63)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	0.68U	16	-	15.32 (≤0.68)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	0.52U	13	-	12.48 (≤0.52)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	1.3U	38	-	36.7 (≤1.3)	J (all detects) UJ (all non-detects)	A
OCDD	3.5U	30	-	26.5 (≤3.5)	J (all detects) UJ (all non-detects)	A
2,3,4,7,8-PeCDF	1.8U	94	-	92.2 (≤1.8)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	1.1U	55	-	53.9 (≤1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	0.63U	31	-	30.4 (≤0.63)	J (all detects) UJ (all non-detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	1,2,3,7,8,9-HxCDD	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-1	TSB-CR-07-10' TSB-CJ-08-10' TSB-CJ-04-10' TSB-CJ-07-0'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-1	TSB-CJ-08-0'	2,3,7,8-TCDF 2,3,7,8-TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-1	TSB-CJ-04-0'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-1	TSB-CR-07-0'	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,4,7,8-PeCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A21
SDG #: TRNC-D-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/15/08
Page: 1 of 1
Reviewer: a
2nd Reviewer: [illegible]

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	A	Sampling dates: 11/9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	SW	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	N	client specified
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 3+4
XV.	Field blanks	ND	R=12

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:

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21	732342 9MB	31	
2	TSB-CR-07-10'	12	RINSATE 1	22	732533 1MB	32	
3	TSB-CJ-08-0'	13		23	733444 0MB	33	
4	TSB-CJ-08-0'-FD	14		24		34	
5	TSB-CJ-08-10'	15		25		35	
6	TSB-CJ-04-0'	16		26		36	
7	TSB-CJ-04-10'	17		27		37	
8	TSB-CJ-07-0'	18		28		38	
9	TSB-CJ-07-10'	19		29		39	
10	TSB-CJ-03-0'	20		30		40	

Notes: _____

LDC #: 18100A21
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration

Page: 1 of 1
Reviewer: a
2nd 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".

Y N N/A Was a routine calibration was performed at the beginning and end of each 12 hour period?

Y N N/A Were all percent differences (%D) of RRFs ≤ 20% for unlabeled compounds and ≤ 30% for labeled?

Y N N/A Did all routine calibration standards meet the Ion Abundance Ratio criteria?

#	Date	Standard ID	Compound	Finding %D 20% (Limit: ~~≤30.0%~~)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	11/9/07	28N007105_20	E	20.5		2-3 ~~5-11~~ 5-8 10-11	V/M/A/P(E)

	PCDDs	Selected Ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

	PCDFs	Selected Ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

LDC #: 18100A21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 8290)

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

(Y) N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/30/07 **Blank analysis date:** 12/4/07
Conc. units: PS/g Associated Samples: 1, 9

Compound	Blank ID	Sample Identification								
	333440MB									
G	5.1									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18102A21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: A
2nd Reviewer: A

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".

Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		732342 9MB	I	33 (40-135)	J (UV) P (4. Q)
				( )	
				( )	
		2	I	32. ( )	
				( )	
		3	A	28 ( )	J (UV) P (H)
			B	30 ( )	(A)
			C	31 ( )	(I. J)
			G	36 ( )	(O. P)
			H	38 ( )	(F)
			I	27 ( )	(4. Q)
				( )	
		5	I	30 ( )	J (UV) P (4. Q)
				( )	
		6	G	37 ( )	(O. P)
			I	18 ( )	(4. Q)
		7		( )	
			I	30 ( )	
				( )	
		8	I	35 ( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,6,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T		

LDC #: 18100A21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding (qpds > calib range)	Associated Samples	Qualifications
		1	K. L. O. P. Q.	1	detects/P
		2.			

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100A21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: 1

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field duplicate pairs identified in this SDG.
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (~~pg~~/g)		D or RPD (≤50)
	3	4	
H	2.1	92	191 √dets/A
I	3.3	210	194
K	5.9	330	193
L	4.2	250	193
O	9.9	570	193

Compound	Concentration ( )		RPD
P	4.1	230	193
~~Q~~	21	1100	193
A	1.0 U	2.6	1.6 (≤1.0) √U+A
B	1.2 U	11	9.8 (≤1.2)
C	0.63U	6.8	6.17 (≤0.63)

Compound	Concentration ( )		RPD
D	0.68U	16	15.32 (≤0.68)
E	0.52U	13	12.48 (≤0.52)
F	1.3 U	38	36.7 (≤1.3)
G	3.5 U	30	26.5 (≤3.5)
J	1.8 U	94	92.2 (≤1.8)

Compound	Concentration ( )		RPD
M	1.1 U	55	53.9 (≤1.1)
N	0.63U	31	30.4 (≤0.63)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: January 24, 2008

Matrix: Soil

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'**
TSB-CR-01-0'**
TSB-CR-01-10'**
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil samples 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 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-CJ-02-0'** TSB-CJ-01-10'** TSB-CR-02-0'** TSB-CR-02-10'** TSB-CR-01-0'** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD	All TCL compounds	31	30	J- (all detects) UJ (all non-detects)	P
TSB-CJ-01-0'**	All TCL compounds	36	30	J- (all detects) UJ (all non-detects)	P

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 with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
12/14/07	1,2,3,4,7,8-HxCDD	20.3	TSB-CJ-02-0'** TSB-CJ-01-10'** TSB-CR-02-0'** TSB-CR-02-10'** TSB-CR-01-0'** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7347435MB	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	A
12/15/07	2,3,7,8-TCDF	38.3	TSB-CR-02-10'** TSB-CJ-06-10' 7347435MB	2,3,7,8-TCDF	J- (all detects) UJ (all non-detects)	P
12/15/07	^{13}C-OCDD	36.1	TSB-CJ-02-0'** TSB-CJ-01-10'** TSB-CR-02-0'** TSB-CR-02-10'** TSB-CR-01-0'** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7347435MB	OCDD OCDF	J+ (all detects) J+ (all detects)	P
12/10/07	1,2,3,4,7,8-HxCDD	20.5	TSB-CJ-01-0'-FD** TSB-CR-01-10'** TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' 7338592MB	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P

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 with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
7334440MB	11/30/07	OCDD	5.1 pg/g	TSB-CJ-02-10'**

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

No field blanks were identified in this SDG.

VI. 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 (%R) and relative percent differences (RPD) were not within QC limits for some compounds, the LCS percent recoveries (%R) were within QC limits and no data were qualified.

VII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
7352533LCS	2,3,4,6,7,8-HxCDF	158 (73-157)	TSB-CJ-01-0'** 7352533MB	J+ (all detects)	P

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-CJ-02-0'**	^{13}C-2,3,7,8-TCDF ^{13}C-2,3,7,8-TCDD ^{13}C-1,2,3,7,8-PeCDF ^{13}C-1,2,3,7,8-PeCDD ^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	31 (40-135) 32 (40-135) 33 (40-135) 33 (40-135) 28 (40-135) 36 (40-135) 21 (40-135) 25 (40-135) 27 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	P

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-CJ-02-10'**	^{13}C-OCDD	34 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-01-10'**	^{13}C-1,2,3,4,6,7,8-HpCDF	37 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CR-01-10'**	^{13}C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-05-10'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	30 (40-135) 30 (40-135) 21 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CJ-06-0'	^{13}C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CJ-05-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	P
TSB-CJ-06-0'-FD	1,2,3,4,6,7,8-HpCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	P

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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'**	TSB-CJ-01-0'-FD**				
2,3,7,8-TCDF	1.7	0.45U	-	1.25 (≤0.45)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	2.9	2.4U	-	0.50 (≤2.4)	-	-
1,2,3,4,6,7,8-HpCDF	5.6	4.3	26 (≤50)	-	-	-
OCDF	11	11	0 (≤50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
2,3,7,8-TCDD	0.30U	12	-	11.7 (≤0.30)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	1.1U	44	-	42.9 (≤1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	0.53U	18	-	17.47 (≤0.53)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	1.6U	60	-	58.4 (≤1.6)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	1.0U	46	-	45.0 (≤1.0)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
1,2,3,4,6,7,8-HpCDD	3.2	150	192 (≤50)	-	J (all detects)	A
OCDD	3.5U	110	-	106.5 (≤3.5)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	7.5	340	191 (≤50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	16	720	191 (≤50)	-	J (all detects)	A
2,3,4,7,8-PeCDF	8.2	350	191 (≤50)	-	J (all detects)	A
1,2,3,4,7,8-HxCDF	24	1100	191 (≤50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	18	790	191 (≤50)	-	J (all detects)	A
2,3,4,6,7,8-HxCDF	5.3	200	190 (≤50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDF	4.1	91	183 (≤50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	42	2000	192 (≤50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	24	990	191 (≤50)	-	J (all detects)	A
OCDF	95	3700	190 (≤50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CR-02-0'** TSB-CR-02-10'** TSB-CR-01-0'** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-01-10'** TSB-CR-02-0'** TSB-CR-02-10'** TSB-CR-01-0'** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	A	Routine calibration (%D)
TRNC-D-2	TSB-CR-02-10'** TSB-CJ-06-10'	2,3,7,8-TCDF	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-01-10'** TSB-CR-02-0'** TSB-CR-02-10'** TSB-CR-01-0'** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	OCDD OCDF	J+ (all detects) J+ (all detects)	P	Routine calibration (%D)
TRNC-D-2	TSB-CJ-01-0'-FD** TSB-CR-01-10'** TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0'	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-2	TSB-CJ-01-0'**	2,3,4,6,7,8-HxCDF	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-2	TSB-CJ-02-0'**	All TCL compounds	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-2	TSB-CJ-02-10'** TSB-CR-01-10'** TSB-CJ-06-0'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-01-10'**	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-2	TSB-CJ-05-10'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-2	TSB-CJ-05-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	J (all detects) J (all detects) J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-06-0'-FD	1,2,3,4,6,7,8-HpCDF	J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-01-0'** TSB-CJ-01-0'-FD**	2,3,7,8-TCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD OCDD	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	1,2,3,4,6,7,8-HpCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B21
SDG #: TRNC-D-2
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/22/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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	SW	Sampling dates: 11/12/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	SW	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	SW	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	A	Not reviewed for Level III validation.
XI.	Compound quantitation and CRQLs	SW	Not reviewed for Level III validation.
XII.	System performance	A	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 3+5. 14+15
XV.	Field blanks	N	

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

MS: 15

1	TSB-CJ-02-0'**		11	TSB-CR-03-10'		21	T33444OMB		31	
2	TSB-CJ-02-10'**		12	TSB-CJ-05-0'		22	T33859MB		32	
3	TSB-CJ-01-0'**		13	TSB-CJ-05-10'		23	T34735MB		33	
4	TSB-CJ-01-10'**		14	TSB-CJ-06-0'		24	T35533MB		34	
5	TSB-CJ-01-0'-FD**		15	TSB-CJ-06-0'-FD		25			35	
6	TSB-CR-02-0'**		16	TSB-CJ-06-10'		26			36	
7	TSB-CR-02-10'**		17	TSB-CR-01-0'MS		27			37	
8	TSB-CR-01-0'**		18	TSB-CR-01-0'MSD		28			38	
9	TSB-CR-01-10'**		19			29			39	
10	TSB-CR-03-0'		20			30			40	

Notes: _____

LDC #: 18100B21
SDG #: Sa cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: [signature]
2nd Reviewer: [signature]

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding 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 ≤ 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) ≤ 20% for unlabeled standards and ≤ 30% for labeled standards?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled standards and ≤ 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				
Was an LCS analyzed for this SDG?	✓			

LDC #: 18100B24
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: W

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?		✓		
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?		✓		
Was the minimum S/N ratio of all internal standard peaks $\geq$ 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?	✓			
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 $\geq$ 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?	✓			
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 #: 18100B21
SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: W

Validation Area	Yes	No	NA	Findings/Comments
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
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-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18100B2/
SDG #: see cooler

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: a
2nd Reviewer: w

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD : HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1	S	N	11-12-07	12-13-07	12-14-07	31	J-/UJ/R
3				12-18-07	12-20-07	36	
4				12-13-07	12-14-07	31	
6					12-15-07		
7							
8							
10							
15							
16							
17(MS)							
18(MSD)							

TECHNICAL HOLDING TIME CRITERIA

EXTRACTABLES

Water: Extracted within 30 days, analyzed within 45 days.
Soil: Extracted within 30 days, analyzed within 45 days.

LDC #: 18100B21
SDG #: See COVER

VALIDATION FINDINGS WORKSHEET
Routine Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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".

(Y) N N/A Was a routine calibration was performed at the beginning and end of each 12 hour period?

Y (N) N/A Were all percent differences (%D) of RRFs ≤ 20% for unlabeled compounds and ≤ 30% for labeled?

(Y) N N/A Did all routine calibration standards meet the Ion Abundance Ratio criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤30.0%~~ ≤20)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	12/14/07	14DE07SDS_2	C	20.3		1.4.6-8.10.15-16 17-18.T34T435MB	J- / UJ / A (C)
	12/15/07	14DE07SDS_20	~~H~~	~~38.3~~		~~T.16.T34T435MB~~ ~~1.4.6-8~~	~~J- / UJ / CB~~ ~~J+ det / P~~
			13C-OCDD	36.1			
	12/15/07	14DE07SDS_20	H	38.3		T.16.T34T435MB 1.4.6-8.10.15-18 T34T435MB	J- / UJ / P (H) J+ det / P (4.8)
			13C-C	36.1			
	12/10/07	10DE07T9DS	C	20.5		5.9.11-14 T33859ZMB	J- / UJ / P (C)

	PCDDs	Selected ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

	PCDFs	Selected ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

LDC #: 18100B21
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 6

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 8290)

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

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/30/07 **Blank analysis date:** 12/4/07
Conc. units: pg/g Associated Samples: 2

Compound	Blank ID	Sample Identification								
7	73440M13									
4	5.1									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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".

[✓ 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.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A 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	Qualifications
		17/18	%R and (RPD) out (for some cpds)			)	8	No qual
				( )	( )	( )		(LCS in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd 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".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	Lab ID/Reference	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7352533LCS	M	158 (73-157)	( )	( )	3, 7352533MB	J+dets/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100321
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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".

(Y) N N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		1	A	31 (40-135)	J/UJ/P (all)
			B	32 ( )	
			C	33 ( )	
			D	33 ( )	
			E	28 ( )	
			F	36 ( )	
			G	21 ( )	
			H	25 ( )	
			I	27 ( )	
				( )	
		2	I	34 ( )	J/UJ/P (G. Q)
				( )	
		4	G	37 ( )	(O. P)
				( )	
		9	I	32 ( )	J/UJ/P (G. Q)
				( )	
		13	G	30 ( )	J/UJ/P (O. P)
			H	30 ( )	(F)
			I	21 ( )	(G. Q)
				( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,4,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T		

LDC #: 18100B2|
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

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".

Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?

(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		14	I	32 (40-135)	J/UJ/P (4-A)
				( )	
		18 (MSD)	A	38 (✓)	No Qual
			G	31 ( )	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,4,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T.		

LDC #: 18600B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

(Y) N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		12	H.O. Q > calib range	12	Q data / J
			↓		↓
		15	0	15	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: ✓

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field duplicate pairs identified in this SDG.
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (pg/g) 3	5	RPD≤50. D≤RL RPD or D
H	1.7	0.45 U	1.25 (≤0.45) ↓/UV/A
K	2.9	2.4 U	0.50 (≤2.4) No Qual
O	5.6	4.3	26 (≤50) ↓
Q	11	11	0 ↓ ↓

Compound	Concentration (pg/g) 14	15	RPD
A	0.30 U	12	11.7 (≤0.30) ↓/UV/A
B	1.1 U	44	42.9 (≤1.1)
C	0.53 U	18	17.47 (≤0.53)
D	1.6 U	60	58.4 (≤1.6)
E	1.0 U	46	45.0 (≤1.0) ↓

Compound	Concentration ( )		RPD≤50. D≤RL RPD
F	3.2	150	192 (≤50) ↓ dets/A
G	3.5 U	110	106.5 (≤3.5) ↓/UV/A
H	7.5	340	191 (≤50) ↓ dets/A
I	16	720	191
V	8.2	350	191

Compound	Concentration ( )		RPD
K	24	1100	191
L	18	790	191
M	5.3	200	190
N	4.1	91	183
O	42	2000	192
P	24	990	191
Q	95	3700	190 ↓ ↓

LDC #: 18180E2|
SDG #: See COVER

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: 1

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 = $(A_x)(C_{is})/(A_{is})(C_x)$
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_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	9/25/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.16T	1.16T	1.13	1.13	3.65	3.46
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.25T	1.25T	1.22	1.22	4.69	4.80
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	~~1.31~~ 1.09	~~1.31~~ 1.09	~~1.40~~ 0.97	0.97	~~13.9~~ 4.25	~~8.27~~ 4.25
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.11	1.11	1.07	1.07	6.58	6.68
			OCDF (^{13}C-OCDD)	3.33	3.33	3.25	3.25	5.72	5.80
2	ICAL	12/5/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.988	0.988	0.97	0.97	3.71	3.84
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.13	1.13	1.18	1.18	2.59	2.52
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.96	0.96	0.99	0.99	1.42	1.17
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.91	0.91	0.90	0.90	0.65	0.917
			OCDF (^{13}C-OCDD)	2.33	2.33	2.33	2.33	~~0.81~~ 0.817	0.833
3	ICAL	12/4/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.883	0.883	0.86	0.86	4.12	4.56
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-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 #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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:

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	1CAL	12/7/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.966	0.966	0.95	0.95	7.17	7.13
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.009	1.009	0.97	0.97	9.76	9.65
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.868	0.868	0.92	0.92	9.19	9.16
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.919	0.919	0.94	0.94	7.69	7.72
			OCDF (^{13}C-OCDD)	2.579	2.579	2.64	2.64	9.58	9.52
2	1CAL	12/4/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.039	1.039	0.98	0.98	5.30	5.42
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-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 #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer:
2nd 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 - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	03DE0[A]DS	12/4/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.16T	1.16	1.16	0.9	0.9
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.254	1.24	1.24	0.9	0.9
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.00T	1.02	1.02	1.4	1.5
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.111	1.11	1.11	0.5	0.5
			OCDF (^{13}C-OCDD)	3.332	3.50	3.50	4.9	4.9
2	020DE0[T]DS	12/20/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.16T	1.11	1.11	4.7	4.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.254	1.23	1.23	1.8	1.8
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.00T	0.99	0.99	1.3	1.2
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.111	1.08	1.08	3.0	3.1
			OCDF (^{13}C-OCDD)	3.332	3.12	3.12	6.4	6.4
3	14DE0[S]DS	12/14/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.966	0.60	0.60	38.3	38.3
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.009	0.78	0.78	22.4	22.4
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.868	0.82	0.82	5.2	5.2
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.919	0.87	0.87	4.8	4.8
			OCDF (^{13}C-OCDD)	2.579	2.36	2.36	8.3	8.3

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 recalculated results.

LDC #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

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 - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	4D20T5D5	12/14/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.966	0.84	0.84	12.7	12.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.009	0.94	0.94	6.4	6.4
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.868	0.86	0.86	0.4	0.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.919	0.91	0.91	0.9	0.9
			OCDF (^{13}C-OCDD)	2.579	2.28	2.28	11.4	11.4
2	10D20T9D5	12/10/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.988	0.98	0.98	1.2	1.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.173	1.13	1.13	3.6	3.6
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.976	0.94	0.94	4.0	4.0
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.911	0.91	0.91	0.2	0.2
			OCDF (^{13}C-OCDD)	2.337	2.45	2.45	4.9	4.9
3	10D20T5D2	12/10/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.883	0.84	0.84	5.2	5.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

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 recalculated results.

LDC #: 18100B21
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: 1
2nd Reviewer: 1

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 - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	04DEQFB52	12/5/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.883	0.92	0.92	4.5	4.5
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
2	1DEQTD2	12/17/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.039	0.90	0.90	13.1	13.1
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3	19DEQTD2	12/20/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.039	1.03	1.03	0.9	0.9
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

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 recalculated results.

LDC #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result
SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 17/18

Compound	Spike Added (PS/S)		Sample Concentration PS/S	Spiked Sample Concentration (PS/S)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		Reported RPD	Recalculated RPD
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	----	----
2,3,7,8-TCDD	20.4	20.4	ND	20.6	27.6	101	101	136	135	29	29
1,2,3,7,8-PeCDD	102	102	↓	102	145	100	100	142	142	35	35
1,2,3,4,7,8-HxCDD	↓		↓	78.9	105	77	77	103	103	29	28
1,2,3,4,7,8,9-HpCDF	↓		13	129	183	114	114	167	167	34	35
OCDF	204	204	57	210	353	75	75	145	145	51	51

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

LDC #: 18100B21
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory 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 = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 733440

Compound	Spike Added (PS/S)		Spiked Sample Concentration (PS/S)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
2,3,7,8-TCDD	20	NA	22.0	NA	110	110				
1,2,3,7,8-PeCDD	100	↓	102	↓	102	102				
1,2,3,4,7,8-HxCDD	↓	↓	93.6	↓	94	94				
1,2,3,4,7,8,9-HpCDF	↓	↓	98.4	↓	98	98				
OCDF	200	↓	220	↓	110	110				

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.

Ions Monitored for HRGC/HRMS Analysis of PCDDs/PCDFs

Descriptor	Accurate mass[a]	Ion ID	Elemental Composition	Analyte	Descriptor	Accurate Mass[a]	Ion ID	Elemental Composition	Analyte
1	303.9016	M	$C_{12}H_4{}^{35}Cl_4O$	TCDF	4	407.7818	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	305.8987	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10$	TCDF		409.7788	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O$	HpCDF
	315.9419	M	$^{13}C_{12}H_4{}^{35}Cl_4O$	TCDF (S)		417.8250	M	$^{13}C_{12}H^{35}Cl_7O$	HpCDF (S)
	317.9389	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO$	TCDF (S)		419.8220	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	319.8965	M	$C_{12}H_4{}^{35}Cl_4O_2$	TCDD		423.7767	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD
	321.8936	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10_2$	TCDD		425.7737	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD
	331.9368	M	$^{13}C_{12}H_4{}^{35}Cl_4O_2$	TCDD (S)		435.8169	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD (S)
	333.9338	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO_2$	TCDD (S)		437.8140	M+4	$^{13}C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD (S)
	375.8364	M+2	$C_{12}H_4{}^{35}Cl_5{}^{37}ClO$	HxCDPE		479.7165	M+4	$C_{12}H^{35}Cl_7{}^{37}Cl_2O$	NCDPE
	[354.9792]	LOCK	C_9F_{13}	PFK		[430.9728]	LOCK	C_9F_{17}	PFK
2	339.8597	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO$	PeCDF	5	441.7428	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO$	OCDF
	341.8567	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF		443.7399	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O$	OCDF
	351.9000	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}C10$	PeCDF (S)		457.7377	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD
	353.8970	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF (S)		459.7348	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD
	355.8546	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD		469.7780	M+2	$^{13}C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD (S)
	357.8516	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD		471.7750	M+4	$^{13}C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD (S)
	367.8949	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD (S)		513.6775	M+4	$C_{12}{}^{35}Cl_8{}^{37}Cl_2O$	DCDPE
	369.8919	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD (S)		[422.9278]	LOCK	$C_{10}F_{17}$	PFK
	409.7974	M+2	$C_{12}H_3{}^{35}Cl_6{}^{37}ClO$	HpCDPE					
	[354.9792]	LOCK	C_9F_{13}	PFK					
3	373.8208	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF					
	375.8178	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O$	HxCDF					
	383.8639	M	$^{13}C_{12}H_2{}^{35}Cl_6O$	HxCDF (S)					
	385.8610	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF (S)					
	389.8156	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD					
	391.8127	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD					
	401.8559	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD (S)					
	403.8529	M+4	$^{13}C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD (S)					
	445.7555	M+4	$C_{12}H_2{}^{35}Cl_6{}^{37}Cl_2O$	OCDPE					
	[430.9728]	LOCK	C_9F_{17}	PFK					

(a) The following nuclidic masses were used:

H = 1.007825	O = 15.994915
C = 12.000000	^{35}Cl = 34.968853
^{13}C = 13.003355	^{37}Cl = 36.965903
F = 18.9984	

S = internal/recovery standard

LDC #: 8100B21
SDG #: Saccolev

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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

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

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

I_s = Amount of internal standard added in nanograms (ng)

V_o = 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 only.

Example:

Sample I.D. 1 , H :

Conc. = $\frac{(1021170)(2000)(1)}{(4174300)(1.039)(10.02)\%0.946}$

= 1.77 PS/g

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 13, 2007

LDC Report Date: February 5, 2008

Matrix: Soil

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'
TSB-DR-06-10'
TSB-DR-05-0'
TSB-DR-05-0'-FD
TSB-DR-05-10'
TSB-DR-03-0'
TSB-DR-03-10'
TSB-DJ-01-0'
TSB-DJ-01-10'
TSB-DR-04-0'
TSB-DR-04-10'
TSB-CR-04-0'
TSB-CR-04-10'
TSB-CR-05-0'
TSB-CR-05-10'
TSB-CR-06-0'
TSB-CR-06-10'
TSB-DR-03-0'MS
TSB-DR-03-0'MSD

Introduction

This data review covers 19 soil samples 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.

Raw data were not reviewed for this SDG. The review was 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% .

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.

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.

No field blanks were identified in this SDG.

VI. 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 (%R) and relative percent differences (RPD) were not within QC limits for some compounds, the LCS percent recoveries (%R) were within QC limits and no data were qualified.

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:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-DR-06-10'	^{13}C-OCDD	38 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-DR-05-0'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	26 (40-135) 25 (40-135) 12 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-05-0'-FD	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	23 (40-135) 22 (40-135) 10 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-03-0'	^{13}C-OCDD	24 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-DR-03-10'	^{13}C-2,3,7,8-TCDF ^{13}C-2,3,7,8-TCDD ^{13}C-1,2,3,7,8-PeCDF ^{13}C-1,2,3,7,8-PeCDD ^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	33 (40-135) 31 (40-135) 26 (40-135) 29 (40-135) 27 (40-135) 23 (40-135) 16 (40-135) 13 (40-135) 9.1 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	P
TSB-DJ-01-0'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	28 (40-135) 24 (40-135) 13 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-DJ-01-10'	^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	35 (40-135) 28 (40-135)	1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-04-0'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	33 (40-135) 32 (40-135) 17 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-04-10'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	39 (40-135) 37 (40-135) 25 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CR-04-0'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	34 (40-135) 32 (40-135) 15 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CR-04-10'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	39 (40-135) 38 (40-135) 31 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CR-05-0'	^{13}C-OCDD	24 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CR-05-10'	^{13}C-OCDD	34 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-DJ-01-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	P

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
2,3,7,8-TCDD	1.5	0.54U	-	0.96 (≤0.54)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	9.6	1.3U	-	8.3 (≤1.3)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	4.7	1.8U	-	2.9 (≤1.8)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	11	1.9U	-	9.1 (≤1.9)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	5.5	1.5U	-	4.0 (≤1.5)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	25	4.3U	-	20.7 (≤4.3)	J (all detects) UJ (all non-detects)	A
OCDD	79	22	113 (≤50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
2,3,7,8-TCDF	50	0.45U	-	49.55 (≤0.45)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDF	100	0.73U	-	99.27 (≤0.73)	J (all detects) UJ (all non-detects)	A
2,3,4,7,8-PeCDF	49	0.75U	-	48.25 (≤0.75)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	160	1.1U	-	158.9 (≤1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDF	120	1.1U	-	118.9 (≤1.1)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	26	1.2U	-	24.8 (≤1.2)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	14	1.2U	-	12.8 (≤1.2)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	310	2.4U	-	307.6 (≤2.4)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8,9-HpCDF	160	2.8U	-	157.2 (≤2.8)	J (all detects) UJ (all non-detects)	A
OCDF	800	3.1U	-	796.9 (≤3.1)	J (all detects) UJ (all non-detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-10' TSB-DR-03-0' TSB-CR-05-0' TSB-CR-05-10'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DJ-01-0' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DR-03-10'	All TCL compounds	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DJ-01-10'	1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DJ-01-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	J (all detects) J (all detects) J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	OCDD	J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-3

No Sample Data Qualified in this SDG

LDC #: 18100C21
SDG #: TRNC-D-3
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/21/08
Page: 1 of 1
Reviewer: 9
2nd Reviewer: V

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	A	Sampling dates: 11/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 3+4
XV.	Field blanks	N	~~R = 18~~

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:

1	TSB-DR-06-0'	11	TSB-DR-04-10'	21	7325524/MB	31	
2	TSB-DR-06-10'	12	TSB-CR-04-0'	22		32	
3	TSB-DR-05-0'	13	TSB-CR-04-10'	23		33	
4	TSB-DR-05-0'-FD	14	TSB-CR-05-0'	24		34	
5	TSB-DR-05-10'	15	TSB-CR-05-10'	25		35	
6	TSB-DR-03-0'	16	TSB-CR-06-0'	26		36	
7	TSB-DR-03-10'	17	TSB-CR-06-10'	27		37	
8	TSB-DJ-01-0'	18	~~RINSTATE-2~~	~~28~~		38	
9	TSB-DJ-01-10'	19	TSB-DR-03-0'MS	29		39	
10	TSB-DR-04-0'	20	TSB-DR-03-0'MSD	30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18100E21
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd 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".

[✓ 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.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A 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	Qualifications
		19/20	%R and RPD out		( )	( )	6	No Qual
				( )	( )	( )		(LCS in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18100C21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 3
Reviewer: Q
2nd Reviewer: 1

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".

Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		2	I	38 (40-135)	J/UJ/P (E.Q)
				( )	
		3	E	26 ( )	J/UJ/P (D.P)
			H	25 ( )	(F)
			J	12 ( )	(G.Q)
				( )	
		4	E	23 ( )	J/UJ/P
			H	22 ( )	
			I	10 ( )	
				( )	
		6	I	24 ( )	J/UJ/P (E.Q)
				( )	
		7	A	33 ( )	J/UJ/P (all)
			B	31 ( )	
			C	26 ( )	
			D	29 ( )	
			E	27 ( )	
			F	23 ( )	
			G	16 ( )	
			H	13 ( )	

	Internal Standards	Check Standard Used		Recovery Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF		K.	^{13}C-1,2,3,4-TCDD	
B.	^{13}C-2,3,7,8-TCDD		L.	^{13}C-1,2,3,7,8,9-HxCDD	
C.	^{13}C-1,2,3,7,8-PeCDF		M.		
D.	^{13}C-1,2,3,7,8-PeCDD		N.		
E.	^{13}C-1,2,3,6,7,8-HxCDF		O.		
F.	^{13}C-1,2,3,6,7,8-HxCDD		P.		
G.	^{13}C-1,2,3,4,6,7,8-HpCDF		Q.		
H.	^{13}C-1,2,3,4,6,7,8-HpCDD		R.		
I.	^{13}C-OCDD		T.		

LDC #: 18100e21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: 9
2nd Reviewer: 2

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".

Y N N/A Are all internal standard recoveries were within the 40-135% criteria?

Y N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)		Qualifications
		7	I	91	(40-135)	✓/U/F (all)
					( )	
		8	G	28	( )	✓/U/F (O.P)
			H	24	( )	(F)
			I	13	( )	(G.R)
					( )	
		9	H	35	( )	
			I	28	( )	
					( )	
		10	G	33	( )	
			H	32	( )	
			I	17	( )	
					( )	
		11	G	39	( )	
			H	37	( )	
			I	25	( )	
					( )	
		12	G	34	( )	
			H	32	( )	
			I	15	( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,6,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T.		

LDC #: 18100cH
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: 9
2nd Reviewer: W

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".

(Y) N N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		13	F	39 (40-135)	J/UJ/P (O.P)
			H	38 ( )	(F)
			I	31 ( )	(G.R)
				( )	
		14	I	24 ( )	
				( )	
		15	I	34 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,6,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T.		

LDC #: 18100C2/
SDG #: 320611

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		8	H.O.R > calib range	8	detects/P

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100c2/
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: 6

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field duplicate pairs identified in this SDG.
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (pg/g) 3	Concentration (pg/g) 4	D or RPD RPD
A	1.5	0.54 U	0.96 (≤0.54) ✓
B	9.6	1.3 U	8.3 (≤1.3)
C	4.7	1.8 U	2.9 (≤1.8)
D	11	1.9 U	9.1 (≤1.9)
E	5.5	1.5 U	4.0 (≤1.5)

Compound	Concentration ( )	Concentration ( )	RPD
F	25	~~4.3~~ 4.3 U	20.7 (≤4.3) ✓
G	79	22	113 (≤50)* J/J/A
H	50	0.45 U	49.55 (≤0.45) J/J/A
I	100	0.73 U	99.27 (≤0.73)
V	49	0.75 U	48.25 (≤0.75)

Compound	Concentration ( )	Concentration ( )	RPD
K	160	1.1 U	158.9 (≤1.1)
L	120	1.1 U	118.9 (≤1.1)
M	26	1.2 U	24.8 (≤1.2)
N	14	1.2 U	12.8 (≤1.2)
O	310	2.4 U	307.6 (≤2.4)

Compound	Concentration ( )	Concentration ( )	RPD
P	160	~~2.8~~ 2.8 U	157.2 (≤2.8)
Q	800	3.1 U	796.9 (≤3.1) ✓

* RPD. alws all D/ND qual present and sup.

LDC Report# 18100D21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: January 24, 2008

Matrix: Soil

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'

Introduction

This data review covers 16 soil samples 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.

Raw data were not reviewed for this SDG. The review was 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% .

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.

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 with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
12/14/07	^{13}C-2,3,7,8-TCDF	60.7	TSB-FR-01-0' TSB-FJ-07-0' TSB-FJ-06-0' TSB-DR-01-0' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	2,3,7,8-TCDF	J+ (all detects)	P

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.

No field blanks were identified in this SDG.

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:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-FJ-07-0'	^{13}C-2,3,7,8-TCDF ^{13}C-2,3,7,8-TCDD ^{13}C-1,2,3,7,8-PeCDF ^{13}C-1,2,3,7,8-PeCDD ^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	21 (40-135) 22 (40-135) 25 (40-135) 26 (40-135) 28 (40-135) 35 (40-135) 39 (40-135) 29 (40-135) 31 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	P
TSB-FJ-05-10'	^{13}C-OCDD	28 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

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-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
2,3,7,8-TCDD	3.9	0.70U	-	3.2 (≤0.70)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	7.0	1.1U	-	5.9 (≤1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	3.2	0.80U	-	2.4 (≤0.80)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	8.3	0.86U	-	7.44 (≤0.86)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	7.2	0.66U	-	6.54 (≤0.66)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	28	0.60U	-	27.4 (≤0.60)	J (all detects) UJ (all non-detects)	A
OCDD	52	1.0U	-	51 (≤1.0)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	92	0.54U	-	91.46 (≤0.54)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDF	75	0.77U	-	74.23 (≤0.77)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
2,3,4,7,8-PeCDF	40	0.79U	-	39.21 (≤0.79)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	120	0.54U	-	119.46 (≤0.54)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDF	79	0.53U	-	78.47 (≤0.53)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	19	0.56U	-	18.44 (≤0.56)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	9.8	0.56U	-	9.24 (≤0.56)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	250	0.74U	-	249.26 (≤0.74)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8,9-HpCDF	94	0.62U	-	93.38 (≤0.62)	J (all detects) UJ (all non-detects)	A
OCDF	850	1.5U	-	848.5 (≤1.5)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
2,3,7,8-TCDD	2.6	0.72U	-	1.88 (≤0.72)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	9.6	2.3U	-	7.3 (≤2.3)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	5.5	1.3U	-	4.2 (≤1.3)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	16	3.6	127 (≤50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDD	12	2.5	131 (≤50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDD	55	13	124 (≤50)	-	J (all detects)	A
OCDD	55	13	124 (≤50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
2,3,7,8-TCDF	66	15	126 (≤50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	150	34	126 (≤50)	-	J (all detects)	A
2,3,4,7,8-PeCDF	73	18	121 (≤50)	-	J (all detects)	A
1,2,3,4,7,8-HxCDF	290	66	126 (≤50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	220	53	122 (≤50)	-	J (all detects)	A
2,3,4,6,7,8-HxCDF	53	14	116 (≤50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDF	20	5.7	111 (≤50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	800	180	126 (≤50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	260	56	129 (≤50)	-	J (all detects)	A
OCDF	1800	380	130 (≤50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FJ-07-0' TSB-FJ-06-0' TSB-DR-01-0' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	2,3,7,8-TCDF	J+ (all detects)	P	Routine calibration (%D)
TRNC-D-4	TSB-FJ-07-0'	All TCL compounds	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-4	TSB-FJ-05-10'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D21
SDG #: TRNC-D-4
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/31/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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	A	Sampling dates: 11/14/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	SW	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	N	client specified
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 5+6, 12+14
XV.	Field blanks	N	

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:
All Soils

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21	T34G23MB	31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22		32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW-DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW-DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17		27		37	
8	TSB-FJ-05-0'	18		28		38	
9	TSB-FJ-05-10'	19		29		39	
10	TSB-DR-01-0'	20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18600 24
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration

Page: 1 of 1
Reviewer: a
2nd Reviewer: L

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".

(Y) N N/A Was a routine calibration was performed at the beginning and end of each 12 hour period?

Y (N) N/A Were all percent differences (%D) of RRFs ≤ 20% for unlabeled compounds and ≤ 30% for labeled?

Y (N) N/A Did all routine calibration standards meet the Ion Abundance Ratio criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	12/14/07	130E07A7D2	13C-H	60.7		1.3.5.10~~,15~~ 12-16	V+/det/P(H)

	PCDDs	Selected Ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

	PCDFs	Selected Ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

LDC #: 18100D-1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: L

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".
Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)		Qualifications
		3	A	21	(40-135)	J/NV/P (all)
			B	22	( )	
			C	25	( )	
			D	26	( )	
			E	28	( )	
			F	35	( )	
			G	39	( )	
			H	29	( )	
			I	31	( )	
					( )	
		9	I	28	( )	J/NV/P (EQ)
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,4,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T		

LDC #: 18100B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: A
2nd reviewer: L

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field duplicate pairs identified in this SDG.
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (pg/g) 5	6	D RPD
A	3.9	0.70 U	3.2 (≤0.70) √/U/A
B	7.0	1.1	5.9 (≤1.1)
C	3.2	0.80	2.4 (≤0.80)
D	8.3	0.86	7.44 (≤0.86)
E	7.2	0.66	6.54 (≤0.66)

Compound	Concentration ( )		RPD
F	28	0.60	27.4 (≤0.60)
G	52	1.0	51 (≤1.0)
H	92	0.54	91.46 (≤0.54)
I	75	0.77	74.23 (≤0.77)
J	40	0.79	39.21 (≤0.79)

Compound	Concentration ( )		RPD
K	120	0.54	119.46 (≤0.54)
L	79	0.53	78.47 (≤0.53)
M	19	0.56	18.44 (≤0.56)
N	9.8	0.56	9.24 (≤0.56)
O	250	0.74	249.26 (≤0.74)

Compound	Concentration ( )		RPD
P	94	0.62	93.38 (≤0.62)
Q	850	1.5 √	848.5 (≤1.5)

LDC #: 18100D1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 4
2nd reviewer: L

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field duplicate pairs identified in this SDG.
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (PS/g) 12	14	RPD or D
A	2.6	0.72U	1.88 (≤0.72)
B	9.6	2.3U	7.3 (≤2.3)
C	5.5	1.3U	4.2 (≤1.3)
D	16	3.6	127 (≤50)
E	12	2.5	131

Compound	Concentration ( )		RPD
F	55	13	124
G	55	13	124
H	66	15	126
I	150	34	126
J	73	18	121

Compound	Concentration ( )		RPD
K	290	66	126
L	220	53	122
M	53	14	116
N	20	5.7	111
O	800	180	126

Compound	Concentration ( )		RPD
P	260	56	129
Q	1800	380	130

* D. other RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: January 24, 2008

Matrix: Soil/Water

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-10-0'**
TSB-FJ-04-0'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FR-02-0'**
TSB-FJ-09-0'**
TSB-FR-03-0'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 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-3 was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank

VI. 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 (%R) and relative percent differences (RPD) were not within QC limits for some compounds, the LCS percent recoveries (%R) were within QC limits and no data were qualified.

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.

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
2,3,7,8-TCDD	1.1	0.095U	-	1.005 (≤0.095)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	3.5	0.13U	-	3.37 (≤0.13)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	5.1	0.18U	-	4.92 (≤0.18)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	4.7	0.23U	-	4.47 (≤0.23)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	16	0.42U	-	15.58 (≤0.42)	J (all detects) UJ (all non-detects)	A
OCDD	52	2.0U	-	50 (≤2.0)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	240	1.7	197 (≤50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	64	0.99U	-	63.01 (≤0.99)	J (all detects) UJ (all non-detects)	A
2,3,4,7,8-PeCDF	63	0.67U	-	62.33 (≤0.67)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	65	1.6U	-	63.4 (≤1.6)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDF	51	0.98U	-	50.02 (≤0.98)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	12	0.25U	-	11.75 (≤0.25)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	6.2	0.18U	-	6.02 (≤0.18)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	150	2.9	192 (≤50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'**	TSB-FJ-03-0'-FD**				
1,2,3,4,7,8,9-HpCDF	52	1.1U	-	50.9 (≤1.1)	J (all detects) UJ (all non-detects)	A
OCDF	360	7.0	192 (≤50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD**	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD**	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E21
SDG #: TRNC-D-5
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 1/22/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

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	A	Sampling dates: 11/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	A	Not reviewed for Level III validation.
XI.	Compound quantitation and CRQLs	A	Not reviewed for Level III validation.
XII.	System performance	A	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 1+2 .576*
XV.	Field blanks	ND	R = 10

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

1	TSB-FJ-03-0'** S	11	TSB-FR-02-0'MS S	21	T33070MB	31		
2	TSB-FJ-03-0'-FD**	12	TSB-FR-02-0'MSD	22	T33428MB	32		
3	TSB-FJ-10-0'**	13		23		33		
4	TSB-FJ-04-0'**	14		24		34		
5	TSB-FJ-02-0'**	15		25		35		
6	TSB-FJ-02-0'-FD**	16		26		36		
7	TSB-FR-02-0'**	17		27		37		
8	TSB-FJ-09-0'**	18		28		38		
9	TSB-FR-03-0'**	19		29		39		
10	RINSATE-3 W	20		30		40		

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18100221
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: 9
2nd Reviewer: [illegible]

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding 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 ≤ 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) ≤ 20% for unlabeled standards and ≤ 30% for labeled standards?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled standards and ≤ 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				
Was an LCS analyzed for this SDG?	✓			

LDC #: 18100231
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

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

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?	✓			
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks $\geq$ 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?	✓			
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 $\geq$ 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?			✓	
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 #: 18100221
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: CL
2nd Reviewer: W

Validation Area	Yes	No	NA	Findings/Comments
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.	✓		✓	
Target compounds were detected in the field blanks.		✓		

LDC #: 18100E21
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: q
2nd Reviewer: L

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".

[✓ 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.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A 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	Qualifications
		11/12	D	( )	( )	32 (≤25)	T	No Qual
			H	39 (80-146)	168 (80-146)	2 ( )		
			K	142 (78-141)	( )	( )		
			Q	0 (70-158)	0 (70-158)	( )		↓
				( )	( )	( )		(<CS m)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18008J
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd reviewer: V

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

(Y) N N/A Were field duplicate pairs identified in this SDG.
(Y) N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (pg/g)		RPD≤50. D≤RL RPD or D
	1	2	
A	1.1	0.095U	1.005 (≤0.095) J/UJ/A
B	3.5	0.13U	3.37 (≤0.13)
D	5.1	0.18U	4.92 (≤0.18)
E	4.7	0.23U	4.47 (≤0.23)
F	16	0.42U	15.58 (≤0.42)

Compound	Concentration ( )		RPD
G	52	2.0U	50 (≤2.0)
H	240	1.7	~~238.3 (≤1.7)~~ 197 (≤50) J dets/A
I	64	0.99U	63.01 (≤0.99) J/UJ/A
J	63	0.67U	62.33 (≤0.67)
K	65	1.6U	63.4 (≤1.6)

Compound	Concentration ( )		RPD
L	51	0.98U	50.02 (≤0.98)
M	12	0.25U	11.75 (≤0.25)
N	6.2	0.18U	6.02 (≤0.18)
O	150	2.9	192 (≤50) J dets/A
P	52	1.1U	50.9 (≤1.1) J/UJ/A

Compound	Concentration ( )		RPD
Q	360	7.0	192 (≤50) J dets/A

LDC #: 18100E2|
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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:

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	9/25/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.16T	1.16T	1.13	1.13	3.65	3.46
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.25A	1.25A	1.22	1.22	4.69	4.80
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	~~1.31~~ 1.00	~~1.31~~ 1.00	~~1.24~~ 0.97	0.97	~~84~~ 13.90	~~8.27~~ 4.25
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.111	1.111	1.07	1.07	6.58	6.68
			OCDF (^{13}C-OCDD)	3.332	3.332	3.25	3.25	5.72	5.80
2	ICAL	12/5/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.988	0.988	0.97	0.97	3.71	3.84
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.173	1.173	1.18	1.18	2.59	2.52
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.976	0.976	0.99	0.99	1.42	1.17
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.911	0.911	0.90	0.90	0.63A	0.917
			OCDF (^{13}C-OCDD)	2.33T	2.33T	2.32	2.33	~~0.817~~	0.823
3	ICAL	12/4/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.883	0.883	0.86	0.86	4.12	4.56
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-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 #: 18100221
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd 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 - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	12DE0710S	12/12/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.16T	1.09	1.09	6.7	6.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.254	1.10	1.10	12.4	12.4
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	~~1.3101.00T~~	0.9T	0.9T	3.6	3.6
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.111	1.0T	1.0T	3.5	3.6
			OCDF (^{13}C-OCDD)	3.332	3.58	3.58	T.5	T.5
2	13DE0710S	12/14/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.16T	1.20	1.20	3.1	3.1
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.254	1.23	1.23	2.3	2.3
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.00T	1.02	1.02	1.5	1.6
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.111	1.09	1.09	1.8	1.8
			OCDF (^{13}C-OCDD)	3.332	3.39	3.39	1.6	1.6
3	DTDE0719DS	12/7/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.988	0.96	0.96	3.0	3.0
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.113	1.07	1.07	8.6	8.6
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.976	1.00	1.00	2.4	2.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.911	0.92	0.92	0.9	0.9
			OCDF (^{13}C-OCDD)	2.33T	2.43	2.43	3.8	3.8

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 recalculated results.

LDC #: 18100221
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: 9
2nd Reviewer: L

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 - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	100E0T9D5	12/11/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.988	0.97	0.97	2.2	2.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.173	1.12	1.12	4.4	4.4
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.976	0.95	0.95	2.5	2.5
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.911	0.911	0.91	0.2	0.2
			OCDF (^{13}C-OCDD)	2.337	2.47	2.47	5.7	5.7
2	100E0T5D2	12/10/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.883	0.84	0.84	5.2	5.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3	100E0T5D2	12/11/07	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.883	~~0.87~~ 0.85	0.85	3.5	3.5
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
	100E0T5D2	12/11/07	~~OCDF (^{13}C-OCDD)~~ H (^{13}C-H)	0.883	0.86	0.86	2.6	2.7

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 recalculated results.

LDC #: 18|0022|
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: LA

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result; SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 11/12

Compound	Spike Added (~~PS~~/g)		Sample Concentration (~~PS~~/g)	Spiked Sample Concentration (~~PS~~/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		Reported RPD	Recalculated RPD
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	----	----
2,3,7,8-TCDD	20.5	20.5	ND	21.7	22.3	106	106	109	109	3.1	2.7
1,2,3,7,8-PeCDD	102	102	↓	101	104	99	99	102	102	2.6	2.9
1,2,3,4,7,8-HxCDD	↓	↓	↓	128	111	125	125	109	109	14	14
1,2,3,4,7,8,9-HpCDF	↓	↓	59	193	181	131	131	119	120	6.7	6.4
OCDF	205	205	1700	875	980	0	0	0	0	0	11

Comments: Refer to Matrix Spike/Matrix Spike 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|0023|
SDG #: See COVER

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: [illegible]

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory 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 = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 733030

Compound	Spike Added (~~PG~~/S)		Spiked Sample Concentration (~~PG~~/S)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
2,3,7,8-TCDD	20	NA	20.2	NA	101	101				
1,2,3,7,8-PeCDD	100	↓	108	↓	108	108				
1,2,3,4,7,8-HxCDD	↓	↓	104	↓	104	104				
1,2,3,4,7,8,9-HpCDF	↓	↓	110	↓	110	110				
OCDF	200	↓	232	↓	116	116				

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.

Ions Monitored for HRGC/HRMS Analysis of PCDDs/PCDFs

Descriptor	Accurate mass[a]	Ion ID	Elemental Composition	Analyte	Descriptor	Accurate Mass[a]	Ion ID	Elemental Composition	Analyte
1	303.9016	M	$C_{12}H_4{}^{35}Cl_4O$	TCDF	4	407.7818	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	305.8987	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10$	TCDF		409.7788	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O$	HpCDF
	315.9419	M	$^{13}C_{12}H_4{}^{35}Cl_4O$	TCDF (S)		417.8250	M	$^{13}C_{12}H^{35}Cl_7O$	HpCDF (S)
	317.9389	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO$	TCDF (S)		419.8220	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	319.8965	M	$C_{12}H_4{}^{35}Cl_4O_2$	TCDD		423.7767	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD
	321.8936	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10_2$	TCDD		425.7737	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD
	331.9368	M	$^{13}C_{12}H_4{}^{35}Cl_4O_2$	TCDD (S)		435.8169	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD (S)
	333.9338	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO_2$	TCDD (S)		437.8140	M+4	$^{13}C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD (S)
	375.8364	M+2	$C_{12}H_4{}^{35}Cl_5{}^{37}ClO$	HxCDPE		479.7165	M+4	$C_{12}H^{35}Cl_7{}^{37}Cl_2O$	NCDPE
	[354.9792]	LOCK	C_9F_{13}	PFK		[430.9728]	LOCK	C_9F_{17}	PFK
2	339.8597	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO$	PeCDF	5	441.7428	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO$	OCDF
	341.8567	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF		443.7399	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O$	OCDF
	351.9000	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}C10$	PeCDF (S)		457.7377	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD
	353.8970	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF (S)		459.7348	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD
	355.8546	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD		469.7780	M+2	$^{13}C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD (S)
	357.8516	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD		471.7750	M+4	$^{13}C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD (S)
	367.8949	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD (S)		513.6775	M+4	$C_{12}{}^{35}Cl_8{}^{37}Cl_2O$	DCDPE
	369.8919	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD (S)		[422.9278]	LOCK	$C_{10}F_{17}$	PFK
	409.7974	M+2	$C_{12}H_3{}^{35}Cl_6{}^{37}ClO$	HpCDPE					
	[354.9792]	LOCK	C_9F_{13}	PFK					
3	373.8208	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF					
	375.8178	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O$	HxCDF					
	383.8639	M	$^{13}C_{12}H_2{}^{35}Cl_6O$	HxCDF (S)					
	385.8610	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF (S)					
	389.8156	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD					
	391.8127	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD					
	401.8559	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD (S)					
	403.8529	M+4	$^{13}C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD (S)					
	445.7555	M+4	$C_{12}H_2{}^{35}Cl_8{}^{37}Cl_2O$	OCDPE					
	[430.9728]	LOCK	C_9F_{17}	PFK					

(a) The following nuclidic masses were used:

H = 1.007825	O = 15.994915
C = 12.000000	^{35}Cl = 34.968853
^{13}C = 13.003355	^{37}Cl = 36.965903
F = 18.9984	

S = internal/recovery standard

LDC #: 18/00221
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: 1

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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

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

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

I_s = Amount of internal standard added in nanograms (ng)

V_o = 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 only.

Example:

Sample I.D. 1 , F :

Conc. = $\frac{(525\text{-}TO)(2000)(1)}{(TPS/400)(0.911)(10.2)(0.956)}$

= 16.27 pg/g

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

LDC Report# 18100F21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 16, 2007

LDC Report Date: January 24, 2008

Matrix: Soil/Water

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FR-05-0'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FJ-01-0'
TSB-GR-01-0'
TSB-GJ-06-0'
TSB-GJ-01-0'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD

Introduction

This data review covers 10 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.

Raw data were not reviewed for this SDG. The review was 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% .

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.

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-4 was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank

VI. 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.

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:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-FR-05-0'	^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	38 (40-135) 38 (40-135) 29 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-GJ-01-0'	^{13}C-1,2,3,7,8-PeCDD ^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	37 (40-135) 27 (40-135) 28 (40-135) 18 (40-135) 18 (40-135) 11 (40-135)	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FR-05-0'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-6	TSB-GJ-01-0'	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F21
SDG #: TRNC-D-6
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/31/08
Page: 1 of 1
Reviewer: 9
2nd Reviewer: V

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	A	Sampling dates: 11/16/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	A SW	~~7 & 8 and RPD out (M 10/11 No final recalc)~~
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	7 = 3+4
XV.	Field blanks	ND	8 = 9

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:

1	TSB-FJ-08-0' S	11	TSB-FJ-01-0'MSD S	21	733428MB	31	
2	TSB-FR-05-0'	12		22	733370 MB	32	
3	TSB-FR-04-0'	13		23		33	
4	TSB-FR-04-0'-FD	14		24		34	
5	TSB-FJ-01-0'	15		25		35	
6	TSB-GR-01-0'	16		26		36	
7	TSB-GJ-06-0'	17		27		37	
8	TSB-GJ-01-0'	18		28		38	
9	RINSATE-4 W	19		29		39	
10	TSB-FJ-01-0'MS S	20		30		40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18100F2l
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

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".
~~Y~~ N N/A Are all internal standard recoveries were within the 40-135% criteria?
Y N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)		Qualifications
		2	G	38	(40-135)	J (N) / P (O.P)
			H	38	( )	(F)
			I	29	( )	(G. R)
					( )	
		8	D	37	( )	J (N) / P (B)
			E	27	( )	(K→N)
			F	28	( )	(C-E)
			G	18	( )	(O. P)
			H	18	( )	(F)
			I	11	( )	(G. R)
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,4,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 24, 2008

Matrix: Soil

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GJ-04-0'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-07-0'
TSB-GJ-05-0'
TSB-GJ-03-0'
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD

Introduction

This data review covers 10 soil samples 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.

Raw data were not reviewed for this SDG. The review was 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% .

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.

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 with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
12/10/07	1,2,3,4,7,8-HxCDD	20.5	TSB-GR-02-0' 7338592MB	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P

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.

No field blanks were identified in this SDG.

VI. 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.

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:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-GJ-04-0'	^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	33 (40-135) 39 (40-135) 15 (40-135) 17 (40-135) 7.5 (40-135)	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-GJ-07-0'	^{13}C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-GJ-05-0'	^{13}C-OCDD	39 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
OCDD	1.7U	10	-	8.3 (≤1.7)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	1.5	3.1	70 (≤50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	1.7U	3.1	-	1.4 (≤1.7)	-	-
1,2,3,4,7,8-HxCDF	1.9U	4.2	-	2.3 (≤1.9)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	2.2U	4.7	-	2.5 (≤2.2)	J (all detects) UJ (all non-detects)	A
OCDF	5.5	12	74 (≤50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0'	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-7	TSB-GJ-04-0'	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-7	TSB-GJ-07-0' TSB-GJ-05-0'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	OCDD 1,2,3,4,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	2,3,7,8-TCDF OCDF	J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G21
SDG #: TRNC-D-7
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/22/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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	A	Sampling dates: 11/19/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	SW	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 1+2. A+5*
XV.	Field blanks	N	

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:
MS Soils

1	TSB-GR-02-0'	11	733859MB	21		31	
2	TSB-GR-02-0'-FD	12		22		32	
3	TSB-GJ-04-0'	13		23		33	
4	TSB-GJ-02-0'	14		24		34	
5	TSB-GJ-02-0'-FD	15		25		35	
6	TSB-GJ-07-0'	16		26		36	
7	TSB-GJ-05-0'	17		27		37	
8	TSB-GJ-03-0'	18		28		38	
9	TSB-GJ-04-0'MS	19		29		39	
10	TSB-GJ-04-0'MSD	20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	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. OCDD	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	I. 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:_____

LDC #: 18100F21
SDG #: SeaCover

VALIDATION FINDINGS WORKSHEET
Routine Calibration

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

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".

(Y) N N/A Was a routine calibration was performed at the beginning and end of each 12 hour period?

Y (N) N/A Were all percent differences (%D) of RRFs ≤ 20% for unlabeled compounds and ≤ 30% for labeled?

(Y) N N/A Did all routine calibration standards meet the Ion Abundance Ratio criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤30.0%~~ >20 %)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	12/10/07	100E0790S2	C	20.5		1. BK	J-/UJ/P (C)

	PCDDs	Selected ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

	PCDFs	Selected ions (m/z)	Ion Abundance Ratio
	Tetra-	M/M+2	0.65-0.89
	Penta-	M+2/M+4	1.32-1.78
	Hexa-	M+2/M+4	1.05-1.43
	Hexa-^{13}C-HxCDF (IS) only	M/M+2	0.43-0.59
	Hepta-^{13}C-HpCDF (IS) only	M/M+2	0.37-0.51
	Hepta-	M+2/M+4	0.88-1.20
	Octa-	M+2/M+4	0.76-1.02

LDC #: 18100G21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: T
2nd 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".

[✓ 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.

[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y [✓ N] N/A 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	Qualifications
		9/10	G	74 (75-153)	~~74 (75-15~~)	( )	3	No qual
			P	( )	( )	25 (≤20)		✓
				( )	( )	( )		(MS. MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18104F21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: L
2nd Reviewer: L

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".

Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		3	E	33 (40-135)	J/UJ/P (K→N)
			F	39 ( )	(C-E)
			G	15 ( )	(D, P)
			H	17 ( )	(F)
			I	7.5 ( )	(G, R)
				( )	
		6	I	32 ( )	J/UJ/P
				( )	
		7	I	39 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF	
B.	^{13}C-2,3,7,8-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF	
D.	^{13}C-1,2,3,7,8-PeCDD	
E.	^{13}C-1,2,3,6,7,8-HxCDF	
F.	^{13}C-1,2,3,6,7,8-HxCDD	
G.	^{13}C-1,2,3,4,6,7,8-HpCDF	
H.	^{13}C-1,2,3,4,6,7,8-HpCDD	
I.	^{13}C-OCDD	

	Recovery Standards	Check Standard Used
K.	^{13}C-1,2,3,4-TCDD	
L.	^{13}C-1,2,3,7,8,9-HxCDD	
M.		
N.		
O.		
P.		
Q.		
R.		
T		

LDC #: 18100421
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 2
2nd reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field duplicate pairs identified in this SDG.
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (pg/g)		RPD or D
	1	2	
G	1.7 U	10	8.3 (≤1.7) ✓/U/A
H	1.5	3.1	70 (≤50) ✓ dets/A *
I	1.7 U	3.1	1.4 (≤1.7) No Qual
K	1.9 U	4.2	2.3 (≤1.9) ✓/U/A
O	2.2 U	4.7	2.5 (≤2.2) ✓

Compound	Concentration ( )		RPD
K	5.5	12	74 (≤50) ✓ dets/A *

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

* RPD. affects D