

**LABORATORY DATA CONSULTANTS, INC.**

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ERM

August 20, 2008

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

SUBJECT: BRC Tronox Parcel C, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on August 14, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19306:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
IRF1295, IRF1807	2,2'-/4,4'-Dichlorobenzil, Hexavalent Chromium & Chlorite

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

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

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist

**LDC #19306 (ERM-Sacramento / BRC Tronox, Parcel C)**

80/20

LDC	SDG#	DATE REC'D	(3) DATE DUE	2,2'1/4,4' -DCB (8270C)		Chlorite (300.1)		Cr(VI) (7196A)		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	W	S	W	S	W	S	W	S	W	S	W	S	W	S			
Matrix:	Water/Soil																																							
A	IRF1295	08/14/08	08/22/08	1	0	1	0	1	0																															
B	IRF1807	08/14/08	08/22/08	0	1	0	1	0	1																															
B	IRF1807	08/14/08	08/22/08	0	1	0	1	0	1																															
				1	2	1	2	1	2																															
Total				T/LR																																				

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

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

**Project/Site Name:** BRC Tronox Parcel C  
**Collection Date:** June 12, 2008  
**LDC Report Date:** August 19, 2008  
**Matrix:** Water  
**Parameters:** 2,2'-/4,4'-Dichlorobenzil  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** IRF1295

**Sample Identification**

RINSATE-2

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for 2,2'-/4,4'-Dichlorobenzil.

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.
- UU 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 30.0% for 2,2'-/4,4'-Dichlorobenzil .

Average relative response factors (RRF) for 2,2'-/4,4'-Dichlorobenzil were within validation criteria.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

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

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

## **V. Blanks**

Method blanks were reviewed for each matrix as applicable. No 2,2'-/4,4'-Dichlorobenzil was found in the method blanks.

Sample RINSATE-2 was identified as a rinsate. No 2,2'-/4,4'-Dichlorobenzil was 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**

The laboratory has indicated that there was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

## **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.

## **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 this report if data has been qualified.

## **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

**BRC Tronox Parcel C  
2,2'-/4,4'-Dichlorobenzil - Data Qualification Summary - SDG IRF1295**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
2,2'-/4,4'-Dichlorobenzil - Laboratory Blank Data Qualification Summary - SDG  
IRF1295**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
2,2'-/4,4'-Dichlorobenzil - Field Blank Data Qualification Summary - SDG IRF1295**

No Sample Data Qualified in this SDG



LDC #: 19306A2 b  
 SDG #: IRF1295  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**  
 Level III

Date: 8/18/08  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC/MS 2,2'-/4,4'-Dichlorobenzil (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: 6/12/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV = 25% NO ECC or SPC
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient spiked
VIII.	Laboratory control samples	A	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	N	
XVII.	Field blanks	ND	R=1

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	RINSATE-2	W	11	3F18250-B41	21	31
2			12		22	32
3			13		23	33
4			14		24	34
5			15		25	35
6			16		26	36
7			17		27	37
8			18		28	38
9			19		29	39
10			20		30	40

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

**Project/Site Name:** BRC Tronox Parcel C  
**Collection Date:** June 12, 2008  
**LDC Report Date:** August 19, 2008  
**Matrix:** Soil  
**Parameters:** 2,2'-/4,4'-Dichlorobenzil  
**Validation Level:** EPA Level III & IV  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** IRF1807

**Sample Identification**

TSB-CJ-09-0'  
TSB-CJ-09-10'\*\*  
TSB-CJ-09-0'MS  
TSB-CJ-09-0'MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for 2,2'-/4,4'-Dichlorobenzil.

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.
- UU 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 30.0% for 2,2'-/4,4'-Dichlorobenzil .

Average relative response factors (RRF) for 2,2'-/4,4'-Dichlorobenzil were within validation criteria.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

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

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

## **V. Blanks**

Method blanks were reviewed for each matrix as applicable. No 2,2'-/4,4'-Dichlorobenzil was found in the method blanks.

Sample RINSATE-2 (from SDG IRF1295) was identified as a rinsate. No 2,2'-/4,4'-Dichlorobenzil was 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.

## **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 are summarized at the end of this report if data has been qualified.

## **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

**BRC Tronox Parcel C  
2,2'-/4,4'-Dichlorobenzil - Data Qualification Summary - SDG IRF1807**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
2,2'-/4,4'-Dichlorobenzil - Laboratory Blank Data Qualification Summary - SDG  
IRF1807**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
2,2'-/4,4'-Dichlorobenzil - Field Blank Data Qualification Summary - SDG IRF1807**

No Sample Data Qualified in this SDG

LDC #: 19306B2b

## VALIDATION COMPLETENESS WORKSHEET

SDG #: IRF1807

Level III/IV

Laboratory: Test America

Date: 6/18/08

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC/MS 2,2'-/4,4'-Dichlorobenzil (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: 6/12/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	NO OCE & SPEC
IV.	Continuing calibration/ICV	A	100% 25/0. ✓
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCG
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	N	
XVII.	Field blanks	ND	Rinsate - 2 (IRF1295)

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-09-0'	5	11	8F23001-Blank 1	21	31
2	TSB-CJ-09-10**	1	12		22	32
3	TSB-CJ-09-0'MS		13		23	33
4	TSB-CJ-09-0'MSD		14		24	34
5			15		25	35
6			16		26	36
7			17		27	37
8			18		28	38
9			19		29	39
10			20		30	40



LDC #: 19306.B2  
 SDG #: IRF1807

**VALIDATION FINDINGS CHECKLIST**

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

**Method: Semivolatiles (EPA SW 846 Method 8270C)**

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. GC/MS Instrument performance check</b>				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?	/			
<b>III. Initial Calibration</b>				
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?	/			
<b>IV. Continuing calibration</b>				
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?	/			
<b>V. Blanks</b>				
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.			/	
<b>VI. Surrogate spikes</b>				
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?			/	
<b>VII. Matrix spike/Matrix spike duplicates</b>				
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?	/			
<b>VIII. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			

LDC #: 19006B2  
 SDG #: IRF1807

**VALIDATION FINDINGS CHECKLIST**

Page: 2 of 2  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>IX. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>X. Internal standards</b>				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds from the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>XI. Target compound identification</b>				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>XII. Compound quantitation/CRQLs</b>				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>XIII. Tentatively identified compounds (TICs)</b>				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>XIV. System performance</b>				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>XV. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>XVI. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>XVII. Field blanks</b>				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

# 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	JJ. 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. <i>2,3/4,4'-Dichlorobenzil</i>
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.

**VALIDATION FINDINGS WORKSHEET**  
**Initial Calibration Calculation Verification**

**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		Recalculated		Reported		Recalculated	
				RRF (std)	RRF (std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD		
1	1234	4/9/08	Phenol (1st internal standard) TTT	1.094	1.094	1.076	1.076	7.2	7.2		
			Naphthalene (2nd internal standard)								
			Fluorene (3rd internal standard)								
			Pentachlorophenol (4th internal standard)								
			Bis(2-ethylhexyl)phthalate (5th internal standard)								
			Benzo(a)pyrene (6th internal standard)								
2			Phenol (1st internal standard)								
			Naphthalene (2nd internal standard)								
			Fluorene (3rd internal standard)								
			Pentachlorophenol (4th internal standard)								
			Bis(2-ethylhexyl)phthalate (5th internal standard)								
			Benzo(a)pyrene (6th internal standard)								
3			Phenol (1st internal standard)								
			Naphthalene (2nd internal standard)								
			Fluorene (3rd internal standard)								
			Pentachlorophenol (4th internal standard)								
			Bis(2-ethylhexyl)phthalate (5th internal standard)								
			Benzo(a)pyrene (6th internal standard)								

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

**VALIDATION FINDINGS WORKSHEET**  
**Continuing Calibration Results Verification**

**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 =  $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$       Where:      ave. RRF = initial calibration average RRF  
 RRF =  $(A_x)(C_s) / (A_s)(C_x)$       RRF = continuing calibration RRF  
 $A_x$  = Area of compound,       $A_s$  = Area of associated internal standard  
 $C_x$  = Concentration of compound,       $C_s$  = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	557008	6/25/18	Phenol (1st internal standard) TTT	1.076	1.124	4.5	1.124	4.4
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to 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 #: 19306B2  
 SDG #: Sec 306d

**VALIDATION FINDINGS WORKSHEET**  
**Surrogate Results Verification**

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd reviewer: [Signature]

**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: 2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	36.57	73	73	0
2-Fluorobiphenyl		36.63	73	73	
Terphenyl-d14	↓	42.40	85	85	
Phenol-d5	100	77.07	77	77	
2-Fluorophenol	↓	78.23	78	78	
2,4,6-Tribromophenol	↓	87.74	88	88	↓
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					

**VALIDATION FINDINGS WORKSHEET**  
**Matrix Spike/Matrix Spike Duplicates Results Verification**

Page: 6 of 9  
 Reviewer: \_\_\_\_\_  
 2nd Reviewer: SR

LDC #: 19306B2  
 SDG #: See CV/en

**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      SC = Sample concentration  
 SA = Spike added

RPD =  $100 * \frac{MSC - MSC1 * 2}{(MSC + MSCD)}$       MSC = Matrix spike concentration      MSCD = Matrix spike duplicate concentration

MS/MSD samples: 3/4

Compound	Spike Added (µg/kg)		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	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol												
N-Nitroso-di-n-propylamine												
4-Chloro-3-methylphenol												
Acenaphthene												
Pentachlorophenol												
Pyrene												
<u>TTT</u>	<u>3870</u>	<u>4220</u>	<u>ND</u>	<u>ND</u>	<u>2980</u>	<u>3680</u>	<u>77</u>	<u>77</u>	<u>86</u>	<u>86</u>	<u>12</u>	<u>12</u>
		<u>3880</u>			<u>3350</u>							

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.

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 =  $\frac{|LCSC - LCSDC|}{LCSC + LCSDC} * 2$  (LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration)

LCS/LCSD samples: 8F83001-B S 1

Compound	Spike Added (µg/L)		Spike Concentration		LCS		LCSD		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol												
N-Nitroso-di-n-propylamine												
4-Chloro-3-methylphenol												
Acenaphthene												
Pentachlorophenol												
Pyrene												
TTT	3320	NA	2470	NA	74	74						

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.



### VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

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

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 agree within 10.0% of the reported results?

- Concentration =  $\frac{A_x(L)(V_i)(DF)(2.0)}{A_s(RRF)(V_o)(V_i)(\%S)}$
- $A_x$  = Area of the characteristic ion (EICP) for the compound to be measured
  - $A_s$  = Area of the characteristic ion (EICP) for the specific internal standard
  - $L$  = 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)
  - $V_c$  = 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. NO , \_\_\_\_\_:

Conc. =  $\frac{( ) ( ) ( ) ( ) ( )}{( ) ( ) ( ) ( ) ( )}$   
 =

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

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

**Project/Site Name:** BRC Tronox Parcel C  
**Collection Date:** June 12, 2008  
**LDC Report Date:** August 18, 2008  
**Matrix:** Water  
**Parameters:** Hexavalent Chromium & Chlorite  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** IRF1295

**Sample Identification**

RINSATE-2

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.1 for Chlorite and EPA SW 846 Method 7196A for Hexavalent Chromium.

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 X.

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	Hexavalent chromium	5 days	24 hours	J- (all detects) R (all non-detects)	P

Non-detected sample concentrations were qualified as unusable (R) due to a gross exceedance (>2X) of holding time.

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 chlorite or hexavalent chromium was found in the initial, continuing and preparation blanks.

Sample RINSATE-2 was identified as a rinsate. No chlorite or hexavalent chromium was found in this blank.

## IV. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the 300.1 method. All surrogate recoveries (%R) were within QC limits.

## V. 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.

## **VI. Duplicates**

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

## **VII. Laboratory Control Samples**

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

## **VIII. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **IX. Overall Assessment of Data**

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

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

**BRC Tronox Parcel C  
Hexavalent Chromium & Chlorite - Data Qualification Summary - SDG IRF1295**

SDG	Sample	Analyte	Flag	A or P	Reason
IRF1295	RINSATE-2	Hexavalent chromium	J- (all detects) R (all non-detects)	P	Technical holding times

**BRC Tronox Parcel C  
Hexavalent Chromium & Chlorite - Laboratory Blank Data Qualification Summary -  
SDG IRF1295**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
Hexavalent Chromium & Chlorite - Field Blank Data Qualification Summary - SDG  
IRF1295**

No Sample Data Qualified in this SDG

LDC #: 19306A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 8/13/08

SDG #: IRF1295

Level III

Page: 1 of 1

Laboratory: Test America

Reviewer: SA

2nd Reviewer: [Signature]

METHOD: (Analyte) Chlorite (EPA Method 300.1), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 6/12/08
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	ASW	
IV	Surrogate Spikes	A	
V	Matrix Spike/Matrix Spike Duplicates	N	} Client Specified
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LLS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	ND	R=1

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:

AN water

1	RINSATE-2	11		21		31	
2	PB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

LDC #: 19306A6  
 SDG #: 1RFL255

**VALIDATION FINDINGS WORKSHEET**  
**Sample Specific Analysis Reference**

Page: 1 of 1  
 Reviewer: ca  
 2nd reviewer: [Signature]

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> <u>Chlorite</u> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN NH <sub>3</sub> TKN TOC CR <sup>0+</sup> _____



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



LDC #: 19306AL  
SDG #: 12F1295

### VALIDATION FINDINGS WORKSHEET

#### Technical Holding Times

Page: 1 of 1  
Reviewer:   
2nd reviewer: 

All circled dates have exceeded the technical holding time.

- N N/A Were all samples preserved as applicable to each method?  
 N N/A Were all cooler temperatures within validation criteria?

Method:		7196A					
Parameters:		C 6°					
Technical holding time:		24 hrs					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
1	6/12/08	6/17/08		(5 days)			J-12/A P

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

**Project/Site Name:** BRC Tronox Parcel C  
**Collection Date:** June 12, 2008  
**LDC Report Date:** August 18, 2008  
**Matrix:** Soil  
**Parameters:** Hexavalent Chromium & Chlorite  
**Validation Level:** EPA Level III & IV  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** IRF1807

**Sample Identification**

TSB-CJ-09-0'  
TSB-CJ-09-10'\*\*  
TSB-CJ-09-0'MS  
TSB-CJ-09-0'MSD

\*\*Indicates sample underwent EPA Level IV review

## Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.1 for Chlorite and EPA SW 846 Method 7196A for Hexavalent Chromium.

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 X.

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.
- UU 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 chlorite or hexavalent chromium was found in the initial, continuing and preparation blanks.

Sample RINSATE-2 (from SDG IRF1295) was identified as a rinsate. No chlorite or hexavalent chromium was found in this blank.

## **IV. Surrogate Spikes**

Surrogates were added to all samples and blanks as required by the 300.1 method. All surrogate recoveries (%R) were within QC limits.

## **V. 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.

## **VI. Duplicates**

Duplicate sample analyses were reviewed for each matrix as applicable.

## **VII. Laboratory Control Samples**

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

### **VIII. 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.

### **IX. Overall Assessment of Data**

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

### **X. Field Duplicates**

No field duplicates were identified in this SDG.

**BRC Tronox Parcel C  
Hexavalent Chromium & Chlorite - Data Qualification Summary - SDG IRF1807**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
Hexavalent Chromium & Chlorite - Laboratory Blank Data Qualification Summary -  
SDG IRF1807**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C  
Hexavalent Chromium & Chlorite - Field Blank Data Qualification Summary - SDG  
IRF1807**

No Sample Data Qualified in this SDG

LDC #: 19306B6  
 SDG #: IRF1807  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**  
 Level III/IV

Date: 8/18/08  
 Page: 1 of 1  
 Reviewer: CA  
 2nd Reviewer: [Signature]

METHOD: (Analyte) Chlorite (EPA Method 300.1), Hexavalent Chromium (EPA SW846 Method 7196A)

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: 6/12/08
Ila.	Initial calibration	A	
Ilb.	Calibration verification	A	
III.	Blanks	A	
IV	Surrogate Spikes	A	
V	Matrix Spike/Matrix Spike Duplicates	A	} MS/MSD
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LLS
VIII.	Sample result verification	A	Not reviewed for Level III validation.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	ND	R = Rin = 2 (from 1251295)

Note: A = Acceptable      ND = No compounds detected      D = Duplicate  
 N = Not provided/applicable      R = Rinsate      TB = Trip blank  
 SW = See worksheet      FB = Field blank      EB = Equipment blank

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

An SD: )

1	TSB-CJ-09-0'	11		21		31	
2	TSB-CJ-09-10**	12		22		32	
3	TSB-CJ-09-0'MS	13		23		33	
4	TSB-CJ-09-0'MSD	14		24		34	
5	PB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



LDC #: 1930686  
 SDG #: 1RF1807

VALIDATION FINDINGS CHECKLIST

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

Method: Inorganics (EPA Method 5.1)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical Holding Times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
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)			/	
<b>III. Blanks</b>				
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.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
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.	/			
<b>V. Laboratory control samples</b>				
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 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?			/	

LDC #: 1930686  
 SDG #: 12F1807

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2  
 Reviewer: MA  
 2nd Reviewer: ✓

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.		/		
Target analytes were detected in the field duplicates.			/	
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC #: 1930686  
SDG #: 12F1803

**VALIDATION FINDINGS WORKSHEET**  
**Sample Specific Analysis Reference**

Page: 1 of 1  
Reviewer: DA  
2nd reviewer: ✓

All circled methods are applicable to each sample.

2c  
sample

Sample ID	Parameter
1-2	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC (CR <sup>6+</sup> ) <u>Chlorite</u>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
3-4	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC (CR <sup>6+</sup> ) <u>Chlorite</u>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>
	pH TDS Cl F NO <sub>3</sub> NO <sub>2</sub> SO <sub>4</sub> PO <sub>4</sub> ALK CN <sup>-</sup> NH <sub>3</sub> TKN TOC CR <sup>6+</sup>

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

LDC #: 11306B  
 SDG #: 1451807

**VALIDATION FINDINGS WORKSHEET**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: SA  
 2nd Reviewer: [Signature]

METHOD: Inorganics, Method Se Cu  
 The correlation coefficient (r) for the calibration of Cu was recalculated. Calibration date: 6/26/08

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	Conc (units)	Abs (units)	Recalculated		Reported		Acceptable (Y/N)
				r	%R	r	%R	
Initial calibration Calibration verification	Blank	0	0					
	Standard 1	0.008	0.006					
	Standard 2	0.01	0.007					
	Standard 3	0.025	0.017					
	Standard 4	0.1	0.079	1.0000		1.0000		Y
	Standard 5	0.5	0.396					
	Standard 6							
	Standard 7							
Calibration verification	Cu	0.3057	0.30			100.2		NR
Calibration verification	Chloride	206.3	200			103.2		NR
Calibration verification								

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.

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

METHOD: Inorganics, Method Su Con

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

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, 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		Reported		Acceptable (Y/N)
					%R / RPD	%R / RPD	%R / RPD	%R / RPD	
8F26088-BS1	Laboratory control sample	Cu	0.33762	0.4	84	84	84	84	Y
8F25062-MS2	Matrix spike sample	Chloride	111.3 (SSR-SFI)	100	111	111	111	111	Y
8F26088-MSD2	Duplicate sample	Cu	0.31784	0.32326	2	2	2	2	Y

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 #: 1730686  
 SDG #: 1RF1FD7

**VALIDATION FINDINGS WORKSHEET**  
Sample Calculation Verification

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd reviewer: [Signature]

METHOD: Inorganics, Method In Com

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".  
 N N/A Have results been reported and calculated correctly?  
 N N/A Are results within the calibrated range of the instruments?  
 N N/A Are all detection limits below the CRQL?

Compound (analyte) results for \_\_\_\_\_ reported with a positive detect were recalculated and verified using the following equation:

Concentration = \_\_\_\_\_ Recalculation: \_\_\_\_\_

AN ND

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_