

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Data Validation Reports
LDC #21991**

Metals

LDC

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: August 3 through August 4, 2009

LDC Report Date: November 18, 2009

Matrix: Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904290

Sample Identification

M-31AB
M-31ABDISS
M-50B
M-21B
FB080409-GW
M-31ABMS
M-31ABDUP
M-50BMS
M-50BDUP

Introduction

This data review covers 9 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, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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	0.9 ug/L	All samples in SDG R0904290
ICB/CCB	Boron Beryllium Chromium Potassium Tungsten	7.9 ug/L 0.10 ug/L 0.7 ug/L 50 ug/L 0.03 ug/L	All samples in SDG R0904290
ICB/CCB	Barium Iron Strontium	1.9 ug/L 5.7 ug/L 0.3 ug/L	M-31AB M-31ABDISS M-50B
ICB/CCB	Barium Strontium	0.8 ug/L 0.2 ug/L	M-21B FB080409-GW
ICB/CCB	Sodium	346 ug/L	M-31AB
ICB/CCB	Sodium	195 ug/L	M-31ABDISS M-50B

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
M-31AB	Beryllium	0.20 ug/L	0.30U ug/L
M-31ABDISS	Copper Tungsten Iron	9.3 ug/L 0.59 ug/L 9.5 ug/L	10.0U ug/L 1.00U ug/L 20.0U ug/L
M-50B	Tungsten	0.65 ug/L	1.00U ug/L
M-21B	Copper Tungsten	5.9 ug/L 0.52 ug/L	10.0U ug/L 1.00U ug/L
FB080409-GW	Boron Copper Chromium Tungsten	9.0 ug/L 0.8 ug/L 0.9 ug/L 0.01 ug/L	50.0U ug/L 10.0U ug/L 5.0U ug/L 0.10U ug/L

Sample FB080409-GW was identified as a field blank. No metal contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB080409-GW	8/4/09	Boron Chromium Copper Tungsten	9.0 ug/L 0.9 ug/L 0.8 ug/L 0.01 ug/L	M-21B

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
M-21B	Copper Tungsten	5.9 ug/L 0.52 ug/L	10.0U ug/L 1.00U ug/L

Sample MC-3B-FILT (from SDG R0902886) was identified as a filter blank. No metal contaminants were found in this blank with the following exceptions:

Filter Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
MC-3B-FILT	5/21/09	Aluminum Antimony Calcium Magnesium Manganese Molybdenum Strontium Titanium Tungsten Zinc	5.3 ug/L 0.03 ug/L 116 ug/L 2.3 ug/L 0.2 ug/L 1.7 ug/L 0.2 ug/L 0.7 ug/L 0.06 ug/L 2.2 ug/L	M-31ABDISS

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
M-31ABDISS	Aluminum Tungsten Zinc	34.3 ug/L 0.59 ug/L 1.4 ug/L	50.0U ug/L 1.00U ug/L 10.0U ug/L

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Duplicate Sample Analysis

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	RPD (Limits)	Difference (Limits)	Flag	A or P
M-31ABDUP (M-31AB M-31ABDISS M-50B)	Platinum	-	1.10 ug/L (≤ 1.00)	J (all detects) UJ (all non-detects)	A
	Tungsten	-	1.11 ug/L (≤ 1.00)	J (all detects) UJ (all non-detects)	

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. 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
M-50BL	Aluminum	10.5 (≤10)	M-31AB M-31ABDISS M-50B	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0904290	All analytes reported below the PQL.	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

No field duplicates were identified in this SDG.

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0904290**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0904290	M-31AB M-31ABDISS M-50B	Platinum Tungsten	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (Difference) (ld)
R0904290	M-31AB M-31ABDISS M-50B	Aluminum	J (all detects) UJ (all non-detects)	A	ICP serial dilution (%D) (sd)
R0904290	M-31AB M-31ABDISS M-50B M-21B FB080409-GW	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0904290**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904290	M-31AB	Beryllium	0.30U ug/L	A	bl
R0904290	M-31ABDISS	Copper Tungsten Iron	10.0U ug/L 1.00U ug/L 20.0U ug/L	A	bl
R0904290	M-50B	Tungsten	1.00U ug/L	A	bl
R0904290	M-21B	Copper Tungsten	10.0U ug/L 1.00U ug/L	A	bl
R0904290	FB080409-GW	Boron Copper Chromium Tungsten	50.0U ug/L 10.0U ug/L 5.0U ug/L 0.10U ug/L	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0904290**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904290	M-21B	Copper Tungsten	10.0U ug/L 1.00U ug/L	A	bf

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Filter Blank Data Qualification Summary - SDG R0904290**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904290	M-31ABDISS	Aluminum Tungsten Zinc	50.0U ug/L 1.00U ug/L 10.0U ug/L	A	br

Tronox Northgate Henderson

LDC #: 21991A4

VALIDATION COMPLETENESS WORKSHEET

Date: 11/7/09

SDG #: R0904290

Stage 2B

Page: 1 of 1

Laboratory: Columbia Analytical Services

Reviewer: CR

2nd Reviewer: W

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

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: 8/3/09-8/4/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS
VII.	Duplicate Sample Analysis	SW	Dup
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	SW	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	SW	FB=5, Filter Blank = MC-3B-FILT (SDG W R0902886)

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: water

1	M-31AB	11	PPW	21		31	
2	M-31ABDISS	12		22		32	
3	M-50B	13		23		33	
4	M-21B	14		24		34	
5	FB080409-GW	15		25		35	
6	M-31ABMS	16		26		36	
7	M-31ABDUP	17		27		37	
8	M-50BMS	18		28		38	
9	↓ DUP	19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
 PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
 Associated Samples: All

Reason Code: bl

Raise to RL unless noted

Analyte	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	RL	Associated Samples: 1-3				
					1	2	3	4	5
B		7.9		50.0					
Be		0.10		0.30	0.20				
Cu	0.9			10.0		9.3		5.9	0.8
Cr		0.7		5.0					0.9
K		50							
W		0.03		1.00		0.59	0.65	0.52	0.01 / 0.10

Analyte	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	RL	Associated Samples: 1-3				
					1	2	3	4	5
Ba		1.9							
Fe		5.7		20.0		9.5			
Sr		0.3							

Analyte	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	RL	Associated Samples: 4-5				
					1	2	3	4	5
Ba		0.8							
Sr		0.2							

Sample Concentration units, unless otherwise noted: ug/L @10x Associated Samples: 1

Analyte	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	RL	No Qualifiers
Na		346	346	3460	

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 2, 3

Analyte	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	RL	No Qualifiers
Na		195			

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

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 14, 2009

LDC Report Date: November 25, 2009

Matrix: Soil/Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0905218

Sample Identification

EB091409-SO1	SA42-10BMS
SA42-10B	SA42-10BDUP
SA42009-10B	RSAR6-37BMS
SA42-25B	RSAR6-37BDUP
SA42-38B	
SA43-10B	
SA43-25B	
SA43-43B	
SA44-10B	
SA44-25B	
SA44-42B	
RSAR6-37B	
RSAR6-25B	
RSAR6-0.5B	
RSAR6-9B	
RSAO8-43B	
RSAO8-11.5B	
RSAO8-21.5B	
EB091409-SO1MS	
EB091409-SO1DUP	

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 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

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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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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)	Tungsten	0.02 ug/L	All water samples in SDG R0905218
ICB/CCB	Aluminum Boron Cobalt Iron Thallium Tungsten	3.0 ug/L 4.5 ug/L 0.6 ug/L 3.5 ug/L 0.002 ug/L 0.07 ug/L	All water samples in SDG R0905218
PB (prep blank)	Aluminum Antimony Calcium Chromium Copper Iron Magnesium Manganese Strontium Tin Tungsten	1.3 mg/Kg 0.5 mg/Kg 5.1 mg/Kg 0.10 mg/Kg 1.2 mg/Kg 2.2 mg/Kg 1.6 mg/Kg 0.04 mg/Kg 0.02 mg/Kg 3.6 mg/Kg 0.015 mg/Kg	All soil samples in SDG R0905218
ICB/CCB	Molybdenum Strontium Tungsten	0.80 ug/L 0.20 ug/L 0.106 ug/L	All soil samples in SDG R0905218

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Platinum Thallium	0.008 ug/L 0.007 ug/L	SA42-10B SA42009-10B SA42-25B
ICB/CCB	Thallium	0.006 ug/L	SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B RSAO8-43B RSAO8-11.5B RSAO8-21.5B
ICB/CCB	Barium Magnesium Nickel Titanium	2.00 ug/L 3.0 ug/L 0.70 ug/L 0.3 ug/L	SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B RSAO8-43B RSAO8-11.5B RSAO8-21.5B
ICB/CCB	Barium Iron Magnesium Manganese Nickel	1.00 ug/L 6.0 ug/L 2.0 ug/L 0.70 ug/L 0.50 ug/L	SA42-10B
ICB/CCB	Iron Manganese	5.0 ug/L 0.90 ug/L	SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Iron Manganese	4.0 ug/L 1.20 ug/L	SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B RSAO8-43B RSAO8-11.5B RSAO8-21.5B

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
EB091409-SO1	Aluminum Boron Tungsten	14.0 ug/L 2.9 ug/L 0.03 ug/L	50.0U ug/L 50.0U ug/L 0.10U ug/L
SA42-10B	Molybdenum Tin Tungsten Platinum	0.22 mg/Kg 4.4 mg/Kg 0.091 mg/Kg 0.011 mg/Kg	0.33U mg/Kg 10.9U mg/Kg 0.10U mg/Kg 0.10U mg/Kg
SA42009-10B	Molybdenum Tin Platinum	0.28 mg/Kg 4.9 mg/Kg 0.011 mg/Kg	0.33U mg/Kg 10.9U mg/Kg 0.11U mg/Kg
SA42-25B	Molybdenum Tin Platinum	0.28 mg/Kg 4.6 mg/Kg 0.008 mg/Kg	0.32U mg/Kg 10.7U mg/Kg 0.11U mg/Kg
SA42-38B	Antimony Tin	0.8 mg/Kg 5.8 mg/Kg	2.5U mg/Kg 12.7U mg/Kg
SA43-10B	Molybdenum Tin	0.17 mg/Kg 4.9 mg/Kg	0.32U mg/Kg 10.7U mg/Kg
SA43-25B	Antimony Tin	0.7 mg/Kg 4.6 mg/Kg	2.1U mg/Kg 10.5U mg/Kg
SA43-43B	Tin	5.9 mg/Kg	11.9U mg/Kg
SA44-10B	Molybdenum Tin	0.24 mg/Kg 4.6 mg/Kg	0.32U mg/Kg 10.7U mg/Kg
SA44-25B	Antimony Molybdenum Tin	0.7 mg/Kg 0.21 mg/Kg 4.6 mg/Kg	2.1U mg/Kg 0.31U mg/Kg 10.4U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA44-42B	Antimony Tin	0.9 mg/Kg 4.3 mg/Kg	2.0U mg/Kg 9.8U mg/Kg
RSAR6-37B	Tin	6.2 mg/Kg	13.1U mg/Kg
RSAR6-25B	Antimony Tin	0.8 mg/Kg 6.3 mg/Kg	2.7U mg/Kg 13.4U mg/Kg
RSAR6-0.5B	Antimony Tin Tungsten	0.5 mg/Kg 5.0 mg/Kg 0.069 mg/Kg	2.1U mg/Kg 10.6U mg/Kg 0.11U mg/Kg
RSAR6-9B	Molybdenum Tin	0.20 mg/Kg 5.0 mg/Kg	0.33U mg/Kg 10.9U mg/Kg
RSAO8-43B	Tin	5.6 mg/Kg	11.8U mg/Kg
RSAO8-11.5B	Tin	4.8 mg/Kg	10.7U mg/Kg
RSAO8-21.5B	Tin	5.2 mg/Kg	10.7U mg/Kg

Sample EB091409-SO1 was identified as an equipment blank. No metal contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB091409-SO1	9/14/09	Aluminum Barium Boron Calcium Iron Lead Magnesium Manganese Potassium Sodium Strontium Tungsten Zinc	14.0 ug/L 0.5 ug/L 2.9 ug/L 266 ug/L 45.1 ug/L 0.037 ug/L 37.9 ug/L 3.7 ug/L 60 ug/L 10.3 ug/L 1.6 ug/L 0.03 ug/L 3.8 ug/L	SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA42-10B	Boron Tungsten	7.3 mg/Kg 0.091 mg/Kg	10.9U mg/Kg 0.10U mg/Kg
SA42009-10B	Boron	7.7 mg/Kg	10.9U mg/Kg
SA43-10B	Boron	8.6 mg/Kg	10.7U mg/Kg
SA44-10B	Boron	6.4 mg/Kg	10.7U mg/Kg
SA44-25B	Boron	8.4 mg/Kg	10.4U mg/Kg
RSAR6-0.5B	Boron Tungsten	6.1 mg/Kg 0.069 mg/Kg	10.6U mg/Kg 0.11U mg/Kg
RSAR6-9B	Boron	8.3 mg/Kg	10.9U mg/Kg

Samples FB072909-SO (from SDG R0904226) and FB082809-SO (from SDG R090894) were identified as field blanks. No metal contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB072909-SO	7/29/09	Aluminum Barium Calcium Copper Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Uranium Zinc	8.1 ug/L 1.0 ug/L 582 ug/L 0.8 ug/L 12.1 ug/L 0.359 ug/L 28.4 ug/L 4.3 ug/L 160 ug/L 1.4 ug/L 0.5 ug/L 0.03 ug/L 0.006 ug/L 10.0 ug/L	SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B
FB082809-SO	8/28/09	Aluminum Calcium Lead Magnesium Manganese Sodium Strontium Zinc	3.3 ug/L 17 ug/L 0.006 ug/L 5.0 ug/L 0.2 ug/L 39.2 ug/L 0.1 ug/L 1.0 ug/L	RSA08-43B RSA08-11.5B RSA08-21.5B

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
SA42-10B	Tungsten	0.091 mg/Kg	0.10U mg/Kg
RSAR6-0.5B	Tungsten	0.069 mg/Kg	0.11U mg/Kg

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
SA42-10BMS (SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B)	Antimony Tungsten	34.0 (75-125) 44.8 (75-125)	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A

VII. Duplicate Sample Analysis

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	RPD (Limits)	Difference (Limits)	Flag	A or P
SA42-10BDUP (SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B)	Barium	28.9 (≤20)	-	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) were within QC limits.

IX. Internal Standards

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

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

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0905218	All analytes reported below the PQL.	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 SA42-10B and SA42009-10B 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)	Flags	A or P
	SA42-10B	SA42009-10B				
Aluminum	11000	11300	3 (≤ 50)	-	-	-
Arsenic	2.52	2.20	-	0.32 (≤ 0.54)	-	-
Barium	166	187	12 (≤ 50)	-	-	-
Beryllium	0.513	0.519	1 (≤ 50)	-	-	-
Boron	7.3	7.7	-	0.4 (≤ 10.9)	-	-
Cadmium	0.70	0.67	4 (≤ 50)	-	-	-
Calcium	44200	31100	35 (≤ 50)	-	-	-
Chromium	8.88	8.52	4 (≤ 50)	-	-	-
Cobalt	7.3	7.6	-	0.3 (≤ 2.2)	-	-
Copper	17.0	18.3	7 (≤ 50)	-	-	-
Iron	13100	15100	14 (≤ 50)	-	-	-
Lead	8.4	10.8	25 (≤ 50)	-	-	-
Magnesium	14200	10800	27 (≤ 50)	-	-	-
Manganese	295	318	8 (≤ 50)	-	-	-
Mercury	0.014	0.005	-	0.009 (≤ 0.019)	-	-
Molybdenum	0.22	0.28	-	0.06 (≤ 0.33)	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA42-10B	SA42009-10B				
Nickel	15.0	15.6	4 (≤ 50)	-	-	-
Platinum	0.011	0.011	-	0 (≤ 0.11)	-	-
Potassium	1970	2320	16 (≤ 50)	-	-	-
Sodium	621	678	9 (≤ 50)	-	-	-
Strontium	303	293	3 (≤ 50)	-	-	-
Thallium	0.099	0.116	-	0.017 (≤ 0.022)	-	-
Tin	4.4	4.9	-	0.5 (≤ 10.9)	-	-
Titanium	729	832	13 (≤ 50)	-	-	-
Tungsten	0.091	0.17	-	0.079 (≤ 0.17)	-	-
Uranium	1.17	1.05	11 (≤ 50)	-	-	-
Vanadium	37.6	41.2	9 (≤ 50)	-	-	-
Zinc	30.7	35.1	13 (≤ 50)	-	-	-

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0905218**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905218	SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B	Antimony Tungsten	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike analysis (%R) (m)
R0905218	SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B	Barium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (ld)
R0905218	EB091409-SO1 SA42-10B SA42009-10B SA42-25B SA42-38B SA43-10B SA43-25B SA43-43B SA44-10B SA44-25B SA44-42B RSAR6-37B RSAR6-25B RSAR6-0.5B RSAR6-9B RSAO8-43B RSAO8-11.5B RSAO8-21.5B	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0905218**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905218	EB091409-SO1	Aluminum Boron Tungsten	50.0U ug/L 50.0U ug/L 0.10U ug/L	A	bl
R0905218	SA42-10B	Molybdenum Tin Tungsten Platinum	0.33U mg/Kg 10.9U mg/Kg 0.10U mg/Kg 0.10U mg/Kg	A	bl
R0905218	SA42009-10B	Molybdenum Tin Platinum	0.33U mg/Kg 10.9U mg/Kg 0.11U mg/Kg	A	bl
R0905218	SA42-25B	Molybdenum Tin Platinum	0.32U mg/Kg 10.7U mg/Kg 0.11U mg/Kg	A	bl
R0905218	SA42-38B	Antimony Tin	2.5U mg/Kg 12.7U mg/Kg	A	bl
R0905218	SA43-10B	Molybdenum Tin	0.32U mg/Kg 10.7U mg/Kg	A	bl
R0905218	SA43-25B	Antimony Tin	2.1U mg/Kg 10.5U mg/Kg	A	bl
R0905218	SA43-43B	Tin	11.9U mg/Kg	A	bl
R0905218	SA44-10B	Molybdenum Tin	0.32U mg/Kg 10.7U mg/Kg	A	bl
R0905218	SA44-25B	Antimony Molybdenum Tin	2.1U mg/Kg 0.31U mg/Kg 10.4U mg/Kg	A	bl
R0905218	SA44-42B	Antimony Tin	2.0U mg/Kg 9.8U mg/Kg	A	bl
R0905218	RSAR6-37B	Tin	13.1U mg/Kg	A	bl
R0905218	RSAR6-25B	Antimony Tin	2.7U mg/Kg 13.4U mg/Kg	A	bl

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905218	RSAR6-0.5B	Antimony Tin Tungsten	2.1U mg/Kg 10.6U mg/Kg 0.11U mg/Kg	A	bl
R0905218	RSAR6-9B	Molybdenum Tin	0.33U mg/Kg 10.9U mg/Kg	A	bl
R0905218	RSAO8-43B	Tin	11.8U mg/Kg	A	bl
R0905218	RSAO8-11.5B	Tin	10.7U mg/Kg	A	bl
R0905218	RSAO8-21.5B	Tin	10.7U mg/Kg	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Equipment Blank Data Qualification Summary - SDG R0905218**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905218	SA42-10B	Boron Tungsten	10.9U mg/Kg 0.10U mg/Kg	A	be
R0905218	SA42009-10B	Boron	10.9U mg/Kg	A	be
R0905218	SA43-10B	Boron	10.7U mg/Kg	A	be
R0905218	SA44-10B	Boron	10.7U mg/Kg	A	be
R0905218	SA44-25B	Boron	10.4U mg/Kg	A	be
R0905218	RSAR6-0.5B	Boron Tungsten	10.6U mg/Kg 0.11U mg/Kg	A	be
R0905218	RSAR6-9B	Boron	10.9U mg/Kg	A	be

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0905218**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905218	SA42-10B	Tungsten	0.10U mg/Kg	A	bf

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905218	RSAR6-0.5B	Tungsten	0.11U mg/Kg	A	bf

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 21991H4

SDG #: R0905218

Laboratory: Columbia Analytical Services

Stage 2B

Date: 11-25-09

Page: 4 of 1

Reviewer: CR

2nd Reviewer: W

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

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: 9/14/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	SW	MS
VII.	Duplicate Sample Analysis	SW	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(2,3)
XV.	Field Blanks	SW	EB=1, FB=1 (B072909-SO, B082809-SO)

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinstate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

(SDG# R0904226) (SDG# R0904894)

Validated Samples: Soil water

1	EB091409-SO1	W	11 SA44-25B	21	EB091409-SO1DUP	W	31	PBW
2	SA42-10B	S	12 SA44-42B	S	22 SA42-10BMS	S	32	PBS
3	SA42009-10B	↓	13 RSAR6-37B	↓	23 SA42-10BDUP	↓	33	
4	SA42-25B	↓	14 RSAR6-25B	↓	24 RSAR6-37BMS	↓	34	
5	SA42-38B	↓	15 RSAR6-0.5B	↓	25 RSAR6-37BDUP	↓	35	
6	SA43-10B	↓	16 RSAR6-9B	↓			36	
7	SA43-25B	↓	17 RSAO8-43B	↓			37	
8	SA43-43B	↓	18 RSAO8-11.5B	↓			38	
9	SA44-10B	↓	19 RSAO8-21.5B	↓			39	
10	SA44-25B	↓	20 EB091409-SO1MS	W			40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
 Reason Code: bl
 Soil preparation factor applied: 200x x 5xdlil
 Associated Samples: All Water

DC #: 21991H4
 SDG #: See Cover
 METHOD: Trace metals (EPA SW 846 Method 6010B/6020/7000)
 Sample Concentration units, unless otherwise noted: ug/L

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	1													
Al			3.0		14.0 / 50.0													
B			4.5		2.9 / 50.0													
Co			0.6															
Fe			3.5															
Tl			0.002															
W		0.02	0.07		0.03 / 0.10													

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All Soil

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18	19
Al	1.3																			
Sb	0.5			0.8 / 2.5					0.7 / 2.1			0.7 / 2.1	0.9 / 2.0		0.8 / 2.7					
Ca	5.1																			
Cr	0.10																			
Cu	1.2																			
Fe	2.2																			
Mo		0.80		0.22 / 0.33	0.28 / 0.33	0.28 / 0.32		0.17 / 0.32			0.24 / 0.32	0.21 / 0.31				0.20 / 0.33				
Mg	1.6																			
Mn	0.04																			
Sr	0.02		0.20																	
Sn	3.6			4.4 / 10.9	4.9 / 10.9	4.6 / 10.7	5.8 / 12.7	4.9 / 10.7	4.6 / 10.5	5.9 / 11.9	4.6 / 10.7	4.6 / 10.4	4.3 / 9.8	6.2 / 13.1	6.3 / 13.4	5.0 / 10.6	5.0 / 10.9	5.6 / 11.8	4.8 / 10.7	5.2 / 10.7
W	0.015	0.106		0.091 / 0.10												0.069 / 0.11				

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^b (ug/L)	Action Limit	2	3	4
Pt			0.008		0.011 / 0.10	0.011 / 0.11	0.008 / 0.11
Tl			0.007				

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 5-10, 12-19

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^b (ug/L)	Action Limit	No Qualifiers
Tl			0.006		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 3-10, 12-19

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^b (ug/L)	Action Limit	No Qualifiers
Ba			2.00		
Mg			3.0		
Ni			0.70		
Tl			0.3		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 2

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^b (ug/L)	Action Limit	No Qualifiers
Ba			1.00		
Fe			6.0		
Mg			2.0		
Mn			0.70		
Ni			0.50		

Reason Code: bl

**VALIDATION FINDINGS WORKSHEET
 PB/ICB/CCB QUALIFIED SAMPLES**

Soil preparation factor applied: 200x x 5xdl
 Associated Samples: 3-10

DC #: 21991H4
 SDG #: See Cover
 METHOD: Trace metals (EPA SW 846 Method 6010B/6020/7000)
 Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers					
Fe			5.0							
Mn			0.90							

Sample Concentration units, unless otherwise noted: mg/Kg

Associated Samples: 12-19

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers					
Fe			4.0							
Mn			1.20							

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

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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)
	2	3				
Aluminum	11000	11300	3			
Arsenic	2.52	2.20		0.32	(<0.54)	
Barium	166	187	12			
Beryllium	0.513	0.519	1			
Boron	7.3	7.7		0.4	(<10.9)	
Cadmium	0.70	0.67	4			
Calcium	44200	31100	35			
Chromium	8.88	8.52	4			
Cobalt	7.3	7.6		0.3	(<2.2)	
Copper	17.0	18.3	7			
Iron	13100	15100	14			
Lead	8.4	10.8	25			
Magnesium	14200	10800	27			
Manganese	295	318	8			
Mercury	0.014	0.005		0.009	(<0.019)	
Molybdenum	0.22	0.28		0.06	(<0.33)	
Nickel	15.0	15.6	4			
Platinum	0.011	0.011		0	(<0.11)	
Potassium	1970	2320	16			

LDC#: 21991H4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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 (Parent Only)
	2	3	RPD	Difference	Limits	
Sodium	621	678	9			
Strontium	303	293	3			
Thallium	0.099	0.116		0.017	(<0.022)	
Tin	4.4	4.9		0.5	(<10.9)	
Titanium	729	832	13			
Tungsten	0.091	0.17		0.079	(±0.17)	
Uranium	1.17	1.05	11			
Vanadium	37.6	41.2	9			
Zinc	30.7	35.1	13			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 15 through September 16, 2009

LDC Report Date: November 25, 2009

Matrix: Soil/Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0905260

Sample Identification

EB091509-SO1	SA65009-0.5B
SA136-0.5B	EB091509-SO1MS
SA136-10B	EB091509-SO1DUP
SA136-25B	SA136-0.5BMS
SA136-40B	SA136-0.5BDUP
SA30-5B	SA153-25BMS
SA30-9B	SA153-25BDUP
SA30-25B	
SA30-38B	
SA153-10B	
SA153-25B	
SA153-38B	
SA172-10B	
SA172-25B	
SA172-40B	
EB091609-SO1	
SA128-0.5B	
SA128-10B	
SA128-29B	
SA65-0.5B	

Introduction

This data review covers 23 soil samples and 4 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, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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)	Tungsten	0.02 ug/L	All water samples in SDG R0905260
ICB/CCB	Aluminum Beryllium Boron Cobalt Strontium Titanium Thallium Tungsten	2.9 ug/L 0.10 ug/L 4.5 ug/L 0.6 ug/L 0.3 ug/L 0.7 ug/L 0.002 ug/L 0.07 ug/L	All water samples in SDG R0905260
PB (prep blank)	Aluminum Magnesium Manganese Nickel Tin	1.0 mg/Kg 0.8 mg/Kg 0.04 mg/Kg 0.08 mg/Kg 4.0 mg/Kg	All soil samples in SDG R0905260
ICB/CCB	Aluminum Barium Manganese Selenium Strontium	4.0 ug/L 0.80 ug/L 0.30 ug/L 4.0 ug/L 0.10 ug/L	SA136-0.5B

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Barium Selenium	0.40 ug/L 5.0 ug/L	SA153-25B SA153-38B SA172-10B SA172-25B SA172-40B SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B
ICB/CCB	Manganese	0.10 ug/L	SA136-10B SA136-25B SA136-40B SA30-5B SA30-9B SA30-25B SA30-38B SA153-10B SA153-25B SA153-38B SA172-10B SA172-25B SA172-40B SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B
ICB/CCB	Tungsten	0.103 ug/L	SA136-0.5B SA136-10B SA136-25B SA136-40B SA30-5B SA30-9B SA30-25B SA30-38B SA153-10B SA153-25B SA153-38B SA172-10B SA172-25B
ICB/CCB	Tungsten	0.109 ug/L	SA172-40B SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B

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
EB091509-SO1	Aluminum Boron Strontium Titanium Tungsten	20.6 ug/L 3.8 ug/L 2.3 ug/L 1.0 ug/L 0.06 ug/L	50.0U ug/L 50.0U ug/L 10.0U ug/L 10.0U ug/L 0.10U ug/L
EB091609-SO1	Aluminum Boron Strontium Tungsten	4.7 ug/L 3.2 ug/L 1.1 ug/L 0.08 ug/L	50.0U ug/L 50.0U ug/L 10.0U ug/L 0.10U ug/L
SA136-0.5B	Tin	4.5 mg/Kg	11.0U mg/Kg
SA136-10B	Tin	5.2 mg/Kg	11.0U mg/Kg
SA136-25B	Tin	5.0 mg/Kg	11.0U mg/Kg
SA136-40B	Tin	4.7 mg/Kg	10.5U mg/Kg
SA30-5B	Tin	8.1 mg/Kg	10.6U mg/Kg
SA30-9B	Tin	5.1 mg/Kg	11.0U mg/Kg
SA30-25B	Tin	5.1 mg/Kg	11.0U mg/Kg
SA30-38B	Tin	5.2 mg/Kg	10.6U mg/Kg
SA153-10B	Tin	4.9 mg/Kg	10.8U mg/Kg
SA153-25B	Tin	4.8 mg/Kg	10.3U mg/Kg
SA153-38B	Tin	5.3 mg/Kg	11.2U mg/Kg
SA172-10B	Tin	5.2 mg/Kg	10.7U mg/Kg
SA172-25B	Tin	4.2 mg/Kg	10.5U mg/Kg
SA172-40B	Tin	4.8 mg/Kg	10.3U mg/Kg
SA128-10B	Tin Selenium	5.0 mg/Kg 1.0 mg/Kg	10.8U mg/Kg 4.3U mg/Kg
SA128-29B	Tin	4.6 mg/Kg	10.9U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA65-0.5B	Tin Selenium	4.9 mg/Kg 0.8 mg/Kg	10.6U mg/Kg 4.2U mg/Kg
SA65009-0.5B	Tin	4.5 mg/Kg	10.6U mg/Kg

Samples EB091509-SO1 and EB091609-SO1 were identified as equipment blanks. No metal contaminants were found in these blanks with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB091509-SO1	9/15/09	Aluminum Barium Boron Calcium Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Uranium Zinc	20.6 ug/L 1.1 ug/L 3.8 ug/L 339 ug/L 95.3 ug/L 0.055 ug/L 63.3 ug/L 13.4 ug/L 77.1 ug/L 2.3 ug/L 1.0 ug/L 0.06 ug/L 0.008 ug/L 3.7 ug/L	SA136-0.5B SA136-10B SA136-25B SA136-40B SA30-5B SA30-9B SA30-25B SA30-38B SA153-10B SA153-25B SA153-38B SA172-10B SA172-25B SA172-40B
EB091609-SO1	9/16/09	Aluminum Boron Calcium Iron Lead Magnesium Manganese Sodium Strontium Tungsten Uranium Zinc	4.7 ug/L 3.2 ug/L 201 ug/L 16.5 ug/L 0.052 ug/L 22.1 ug/L 3.1 ug/L 113 ug/L 1.1 ug/L 0.08 ug/L 0.003 ug/L 1.4 ug/L	SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA136-10B	Boron	7.4 mg/Kg	11.0U mg/Kg
SA136-25B	Boron	6.9 mg/Kg	11.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA30-5B	Boron	5.6 mg/Kg	10.6U mg/Kg
SA30-9B	Boron	6.5 mg/Kg	11.0U mg/Kg
SA30-25B	Boron	9.6 mg/Kg	11.0U mg/Kg
SA153-25B	Boron	9.6 mg/Kg	10.3U mg/Kg
SA172-10B	Boron	4.7 mg/Kg	10.7U mg/Kg
SA172-25B	Boron	5.4 mg/Kg	10.5U mg/Kg
SA128-10B	Boron	6.1 mg/Kg	10.8U mg/Kg
SA65-0.5B	Boron	6.7 mg/Kg	10.6U mg/Kg
SA65009-0.5B	Boron	5.8 mg/Kg	10.6U mg/Kg

Sample FB072909-SO (from SDG R0904226) was identified as a field blank. No metal contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB072909-SO	7/29/09	Aluminum Barium Calcium Copper Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Uranium Zinc	8.1 ug/L 1.0 ug/L 582 ug/L 0.8 ug/L 12.1 ug/L 0.359 ug/L 28.4 ug/L 4.3 ug/L 160 ug/L 1.4 ug/L 0.5 ug/L 0.03 ug/L 0.006 ug/L 10.0 ug/L	All soil samples in SDG R0905260

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

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
SA136-0.5BMS (All soil samples in SDG R0905260)	Antimony	61.6 (75-125)	J- (all detects) UJ (all non-detects)	A
SA136-0.5BMS (All soil samples in SDG R0905260)	Manganese	143.2 (75-125)	J+ (all detects)	A

VII. Duplicate Sample Analysis

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

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

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

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0905260	All analytes reported below the PQL.	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 SA65-0.5B and SA65009-0.5B 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)	Flags	A or P
	SA65-0.5B	SA65009-0.5B				
Aluminum	9670	8340	15 (≤ 50)	-	-	-
Arsenic	2.16	2.23	-	0.07 (≤ 0.54)	-	-
Barium	176	168	5 (≤ 50)	-	-	-
Beryllium	0.461	0.474	3 (≤ 50)	-	-	-
Boron	6.7	5.8	-	0.9 (≤ 10.6)	-	-
Cadmium	0.34	0.17	-	0.17 (≤ 0.11)	J (all detects)	A
Calcium	24200	24900	3 (≤ 50)	-	-	-
Chromium	7.32	8.06	10 (≤ 50)	-	-	-
Cobalt	8.4	8.4	-	0 (≤ 2.1)	-	-
Copper	20.2	18.9	7 (≤ 50)	-	-	-
Iron	17700	15800	11 (≤ 50)	-	-	-
Lead	10.1	9.0	-	1.1 (≤ 2.1)	-	-
Magnesium	10700	11000	3 (≤ 50)	-	-	-
Manganese	463	429	8 (≤ 50)	-	-	-
Mercury	0.010	0.014	-	0.004 (≤ 0.018)	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA65-0.5B	SA65009-0.5B				
Molybdenum	0.32	0.43	-	0.11 (≤ 0.32)	-	-
Nickel	17.4	18.6	7 (≤ 50)	-	-	-
Platinum	0.012	0.012	-	0 (≤ 0.11)	-	-
Potassium	2890	2430	17 (≤ 50)	-	-	-
Selenium	0.8	0.7U	-	0.1 (≤ 4.3)	-	-
Sodium	550	561	2 (≤ 50)	-	-	-
Strontium	153	128	-	25 (≤ 42.6)	-	-
Thallium	0.115	0.128	11 (≤ 50)	-	-	-
Tin	4.9	4.5	-	0.4 (≤ 10.6)	-	-
Titanium	985	767	25 (≤ 50)	-	-	-
Tungsten	0.19	0.13	-	0.06 (≤ 0.11)	-	-
Uranium	0.872	0.919	5 (≤ 50)	-	-	-
Vanadium	53.2	48.0	10 (≤ 50)	-	-	-
Zinc	42.7	35.9	17 (≤ 50)	-	-	-

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0905260**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905260	SA136-0.5B SA136-10B SA136-25B SA136-40B SA30-5B SA30-9B SA30-25B SA30-38B SA153-10B SA153-25B SA153-38B SA172-10B SA172-25B SA172-40B SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike analysis (%R) (m)
R0905260	SA136-0.5B SA136-10B SA136-25B SA136-40B SA30-5B SA30-9B SA30-25B SA30-38B SA153-10B SA153-25B SA153-38B SA172-10B SA172-25B SA172-40B SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B	Manganese	J+ (all detects)	A	Matrix spike analysis (%R) (m)

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905260	EB091509-SO1 SA136-0.5B SA136-10B SA136-25B SA136-40B SA30-5B SA30-9B SA30-25B SA30-38B SA153-10B SA153-25B SA153-38B SA172-10B SA172-25B SA172-40B EB091609-SO1 SA128-0.5B SA128-10B SA128-29B SA65-0.5B SA65009-0.5B	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)
R0905260	SA65-0.5B SA65009-0.5B	Cadmium	J (all detects)	A	Field duplicates (Difference) (fd)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0905260**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905260	EB091509-SO1	Aluminum Boron Strontium Titanium Tungsten	50.0U ug/L 50.0U ug/L 10.0U ug/L 10.0U ug/L 0.10U ug/L	A	bl
R0905260	EB091609-SO1	Aluminum Boron Strontium Tungsten	50.0U ug/L 50.0U ug/L 10.0U ug/L 0.10U ug/L	A	bl
R0905260	SA136-0.5B	Tin	11.0U mg/Kg	A	bl
R0905260	SA136-10B	Tin	11.0U mg/Kg	A	bl
R0905260	SA136-25B	Tin	11.0U mg/Kg	A	bl
R0905260	SA136-40B	Tin	10.5U mg/Kg	A	bl
R0905260	SA30-5B	Tin	10.6U mg/Kg	A	bl

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905260	SA30-9B	Tin	11.0U mg/Kg	A	bl
R0905260	SA30-25B	Tin	11.0U mg/Kg	A	bl
R0905260	SA30-38B	Tin	10.6U mg/Kg	A	bl
R0905260	SA153-10B	Tin	10.8U mg/Kg	A	bl
R0905260	SA153-25B	Tin	10.3U mg/Kg	A	bl
R0905260	SA153-38B	Tin	11.2U mg/Kg	A	bl
R0905260	SA172-10B	Tin	10.7U mg/Kg	A	bl
R0905260	SA172-25B	Tin	10.5U mg/Kg	A	bl
R0905260	SA172-40B	Tin	10.3U mg/Kg	A	bl
R0905260	SA128-10B	Tin Selenium	10.8U mg/Kg 4.3U mg/Kg	A	bl
R0905260	SA128-29B	Tin	10.9U mg/Kg	A	bl
R0905260	SA65-0.5B	Tin Selenium	10.6U mg/Kg 4.2U mg/Kg	A	bl
R0905260	SA65009-0.5B	Tin	10.6U mg/Kg	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Equipment Blank Data Qualification Summary - SDG R0905260**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905260	SA136-10B	Boron	11.0U mg/Kg	A	be
R0905260	SA136-25B	Boron	11.0U mg/Kg	A	be
R0905260	SA30-5B	Boron	10.6U mg/Kg	A	be
R0905260	SA30-9B	Boron	11.0U mg/Kg	A	be

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905260	SA30-25B	Boron	11.0U mg/Kg	A	be
R0905260	SA153-25B	Boron	10.3U mg/Kg	A	be
R0905260	SA172-10B	Boron	10.7U mg/Kg	A	be
R0905260	SA172-25B	Boron	10.5U mg/Kg	A	be
R0905260	SA128-10B	Boron	10.8U mg/Kg	A	be
R0905260	SA65-0.5B	Boron	10.6U mg/Kg	A	be
R0905260	SA65009-0.5B	Boron	10.6U mg/Kg	A	be

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0905260**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 2199114

SDG #: R0905260

Laboratory: Columbia Analytical Services

Stage 2B

Date: 11-25-09

Page: 1 of 1

Reviewer: CR

2nd Reviewer: V

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

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: 9/15/09-9/16/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	SW MS	
VII.	Duplicate Sample Analysis	A Dup	
VIII.	Laboratory Control Samples (LCS)	A LCS	
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW (20,21)	
XV.	Field Blanks	SW EB=1,16. FB=FB072909-SO (SP6A R0901226)	

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	EB091509-SO1	W	11	SA153-25B	S	21	SA65009-0.5B	S	31	PBW
2	SA136-0.5B	S	12	SA153-38B	↓	22	EB091509-SO1MS	W	32	PBS
3	SA136-10B	↓	13	SA172-10B	↓	23	EB091509-SO1DUP	↓	33	
4	SA136-25B	↓	14	SA172-25B	↓	24	SA136-0.5BMS	S	34	
5	SA136-40B	↓	15	SA172-40B	↓	25	SA136-0.5BDUP	↓	35	
6	SA30-5B	↓	16	EB091609-SO1	W	26	SA153-25BMS	↓	36	
7	SA30-9B	↓	17	SA128-0.5B	S	27	SA153-25BDUP	↓	37	
8	SA30-25B	↓	18	SA128-10B	↓	28			38	
9	SA30-38B	↓	19	SA128-29B	↓	29			39	
10	SA153-10B	↓	20	SA65-0.5B	↓	30			40	

Notes: _____

Reason Code: bl

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 200x x 5xdl
 Associated Samples: All Water

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	Associated Samples													
					1	16												
Al			2.9		20.6 / 50.0	4.7 / 50.0												
Be			0.10															
B			4.5		3.8 / 50.0	3.2 / 50.0												
Cd			0.6															
Sr			0.3		2.3 / 10.0	1.1 / 10.0												
Ti			0.7		1.0 / 10.0													
Tl			0.002															
W		0.02	0.07		0.06 / 0.10	0.08 / 0.10												

Sample Concentration units: mg/Kg unless otherwise noted: mg/Kg Associated Samples: All Soil

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	Associated Samples														
				2	3	4	5	6	7	8	9	10	11	12	13			
Al	1.0																	
Mg	0.8																	
Mn	0.04																	
Ni	0.08																	
Sn	4.0			4.5 / 11.0	5.2 / 11.0	5.0 / 11.0	4.7 / 10.5	8.1 / 10.6	5.1 / 11.0	5.1 / 11.0	5.1 / 11.0	5.2 / 10.6	4.9 / 10.8	4.8 / 10.3	5.3 / 11.2	5.2 / 10.7		

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	Associated Samples	
				14	21
Al	1.0				
Mg	0.8				
Mn	0.04				
Ni	0.08				
Sn	4.0			4.2 / 10.5	4.5 / 10.6

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Al			4.0		
Ba			0.80		
Mn			0.30		
Se			4.0		
S			0.10		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 11-15, 17-21

Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Ba			0.40		18
Se			5.0		20
					1.0 / 4.3
					0.8 / 4.2

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 3-15, 17-21

Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mn			0.10		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 2-14

Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
W			0.103		

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers					
W			0.109							

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

LDC #: 2199114
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y **N** **N/A**
 Were field blanks identified in this SDG?
 Y **N** **N/A**
 Were target analytes detected in the field blanks?

Reason Code: be

Blank units: ug/L Associated sample units: mg/Kg

Sampling date: 9/15/09 Soil factor applied: 200X

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

Associated Samples: 2-15

Analyte	Blank ID	Sample Identification														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Al	20.6															
Ba	1.1															
B	3.8			7.4 / 11.0	6.9 / 11.0		5.6 / 10.6	6.5 / 11.0	9.6 / 11.0		9.5 / 10.3		4.7 / 10.7	5.4 / 10.5		
Ca	339															
Fe	95.3															
Pb	0.055															
Mg	63.3															
Mn	13.4															
Na	77.1															
Sr	2.3															
Ti	1.0															
W	0.06															
U	0.008															
Zn	3.7															

LDC #: 2199114
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

N/A Were field blanks identified in this SDG?
 N/A Were target analytes detected in the field blanks?

Reason Code: be

Blank units: ug/L **Associated sample units:** mg/Kg

Sampling date: 9/16/09 **Soil factor applied:** 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: **EQ** Associated Samples: 17-21

Analyte	Blank ID	16	18	20	21	Sample Identification
Al	4.7					
B	3.2	6.1 / 10.8	6.7 / 10.6	5.8 / 10.6		
Ca	201					
Fe	16.5					
Pb	0.052					
Mg	22.1					
Mn	3.1					
Na	113					
Sr	1.1					
W	0.08					
U	0.003					
Zn	1.4					

LDC #: 2199114

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Field Blanks

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

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

Y Were field blanks identified in this SDG?

N Were target analytes detected in the field blanks?

Y N N/A N/A Associated sample units: mg/Kg

Blank units: ug/L Associated sample units: mg/Kg

Sampling date: 7/29/09 Soil factor applied 100x

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

Reason Code: bf

Associated Samples: All Soil

Analyte	Blank ID	Action Level	No Qualifiers	Sample Identification			
	FB072909-SO (SDG#: R0904226)						
Al	8.1						
Ba	1.0						
Ca	582	582					
Cu	0.8						
Fe	12.1						
Pb	0.359	0.359					
Mg	28.4	28.4					
Mn	4.3						
Na	160						
Sr	1.4						
Ti	0.5						
W	0.03						
U	0.006						
Zn	10.0	10.0					

LDC 2199114
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 12 of 22
Reviewer: [Signature]
2nd Reviewer: [Signature]

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

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 (Parent Only)
	20	21	RPD	Difference	Limits	
Aluminum	9670	8340	15			
Arsenic	2.16	2.23		0.07	(<0.54)	
Barium	176	168	5			
Beryllium	0.461	0.474	3			
Boron	6.7	5.8		0.9	(<10.6)	
Cadmium	0.34	0.17		0.17	(<0.11)	Jdet/A (fd)
Calcium	24200	24900	3			
Chromium	7.32	8.06	10			
Cobalt	8.4	8.4		0	(<2.1)	
Copper	20.2	18.9	7			
Iron	17700	15900	11			
Lead	10.1	9.0		1.1	(<2.1)	
Magnesium	10700	11000	3			
Manganese	463	429	8			
Mercury	0.010	0.014		0.004	(<0.018)	
Molybdenum	0.32	0.43		0.11	(<0.32)	
Nickel	17.4	18.6	7			
Platinum	0.012	0.012		0	(≤0.11)	
Potassium	2890	2430	17			

LDC#: 2199114
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 2
 Reviewer: CP
 2nd Reviewer: L

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

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)
	20	21				
Selenium	0.8	0.70		0.1	(<4.3)	
Sodium	550	561	2			
Strontium	153	128		25	(<42.6)	
Thallium	0.115	0.128	11			
Tin	4.9	4.5		0.4	(± 10.6)	
Titanium	985	767	25			
Tungsten	0.13	0.13		0.06	(± 0.11)	
Uranium	0.872	0.919	5			
Vanadium	53.2	48.0	10			
Zinc	42.7	35.9	17			

V:\FIELD DUPLICATES\FD_inorganic\2199114.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 18, 2009

LDC Report Date: November 25, 2009

Matrix: Soil/Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0905348

Sample Identification

EB091809-SO1
SA117-0.5B
SA117-9B
SA117-25B
SA117-41B
SA161-0.5B
SA161-10B
SA161-25B
SA161009-25B
SA161-37B
SA117-0.5BMS
SA117-0.5BDUP
SA117-9BMS
SA117-9BDUP

Introduction

This data review covers 13 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, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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)	Tungsten	0.02 ug/L	All water samples in SDG R0905348
ICB/CCB	Aluminum Beryllium Boron Cobalt Strontium Titanium Thallium Tungsten	2.9 ug/L 0.10 ug/L 4.5 ug/L 0.6 ug/L 0.3 ug/L 0.7 ug/L 0.002 ug/L 0.07 ug/L	All water samples in SDG R0905348
PB (prep blank)	Aluminum Chromium Iron Magnesium Manganese Mercury Selenium Strontium Tin	0.8 mg/Kg 0.06 mg/Kg 1.0 mg/Kg 1.2 mg/Kg 0.02 mg/Kg 0.002 mg/Kg 0.9 mg/Kg 0.02 mg/Kg 3.3 mg/Kg	All soil samples in SDG R0905348
ICB/CCB	Boron Magnesium Strontium	3.0 ug/L 2.0 ug/L 0.10 ug/L	All soil samples in SDG R0905348

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Barium Manganese	0.50 ug/L 0.10 ug/L	SA161-0.5B
ICB/CCB	Manganese	0.30 ug/L	SA117-0.5B SA117-9B SA117-25B SA117-41B SA161-10B SA161-25B SA161009-25B SA161-37B
ICB/CCB	Tungsten Uranium	0.084 ug/L 0.037 ug/L	SA117-0.5B SA161-0.5B SA161-10B SA161-25B SA161009-25B SA161-37B
ICB/CCB	Tungsten	0.083 ug/L	SA117-9B SA117-25B SA117-41B

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
EB091809-SO1	Aluminum Boron Strontium Tungsten	10.1 ug/L 2.9 ug/L 2.4 ug/L 0.06 ug/L	50.0U ug/L 50.0U ug/L 10.0U ug/L 0.10U ug/L
SA117-0.5B	Boron Strontium Tin Mercury	6.5 mg/Kg 161 mg/Kg 3.3 mg/Kg 0.013 mg/Kg	10.6U mg/Kg 213U mg/Kg 10.6U mg/Kg 0.016U mg/Kg
SA117-9B	Boron Selenium Tin Mercury	7.9 mg/Kg 1.0 mg/Kg 4.1 mg/Kg 0.015 mg/Kg	10.8U mg/Kg 4.3U mg/Kg 10.8U mg/Kg 0.016U mg/Kg
SA117-25B	Boron Tin Mercury	8.8 mg/Kg 3.8 mg/Kg 0.002 mg/Kg	10.8U mg/Kg 10.8U mg/Kg 0.016U mg/Kg
SA117-41B	Boron Tin Mercury	9.9 mg/Kg 4.4 mg/Kg 0.010 mg/Kg	11.5U mg/Kg 11.5U mg/Kg 0.017U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA161-0.5B	Boron Tin	5.6 mg/Kg 4.0 mg/Kg	10.8U mg/Kg 10.8U mg/Kg
SA161-10B	Boron Tin Mercury	10.0 mg/Kg 3.9 mg/Kg 0.010 mg/Kg	10.7U mg/Kg 10.7U mg/Kg 0.015U mg/Kg
SA161-25B	Selenium Tin Mercury	0.8 mg/Kg 3.6 mg/Kg 0.019 mg/Kg	4.3U mg/Kg 10.8U mg/Kg 0.020U mg/Kg
SA161009-25B	Selenium Tin	1.3 mg/Kg 4.3 mg/Kg	4.3U mg/Kg 10.8U mg/Kg
SA161-37B	Tin Mercury	3.7 mg/Kg 0.009 mg/Kg	10.4U mg/Kg 0.021U mg/Kg

Sample EB091809-SO1 was identified as an equipment blank. No metal contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB091809-SO1	9/18/09	Aluminum Barium Boron Calcium Chromium Iron Lead Magnesium Manganese Potassium Sodium Strontium Tungsten Uranium Zinc	10.1 ug/L 0.4 ug/L 2.9 ug/L 291 ug/L 0.8 ug/L 35.2 ug/L 0.086 ug/L 37.3 ug/L 5.6 ug/L 60 ug/L 134 ug/L 2.4 ug/L 0.06 ug/L 0.004 ug/L 6.2 ug/L	All soil samples in SDG R0905348

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA117-0.5B	Boron Strontium	6.5 mg/Kg 161 mg/Kg	10.6U mg/Kg 213U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA117-9B	Boron	7.9 mg/Kg	10.8U mg/Kg
SA117-25B	Boron	8.8 mg/Kg	10.8U mg/Kg
SA117-41B	Boron	9.9 mg/Kg	11.5U mg/Kg
SA161-0.5B	Boron	5.6 mg/Kg	10.8U mg/Kg
SA161-10B	Boron	10.0 mg/Kg	10.7U mg/Kg

Sample FB072909-SO (from SDG R0904226) was identified as a field blank. No metal contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB072909-SO	7/29/09	Aluminum Barium Calcium Copper Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Uranium Zinc	8.1 ug/L 1.0 ug/L 582 ug/L 0.8 ug/L 12.1 ug/L 0.359 ug/L 28.4 ug/L 4.3 ug/L 160 ug/L 1.4 ug/L 0.5 ug/L 0.03 ug/L 0.006 ug/L 10.0 ug/L	All soil samples in SDG R0905348

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
SA117-0.5B	Strontium	161 mg/Kg	213U mg/Kg

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
SA117-0.5BMS (All soil samples in SDG R0905348)	Antimony Selenium Tungsten	53.2 (75-125) 74.6 (75-125) 61.4 (75-125)	J- (all detects) UJ (all non-detects)	A
SA117-0.5BMS (All soil samples in SDG R0905348)	Manganese	129.3 (75-125)	J+ (all detects)	A

VII. Duplicate Sample Analysis

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	RPD (Limits)	Difference (Limits)	Flag	A or P
SA117-0.5BDUP (All soil samples in SDG R0905348)	Calcium Nickel Titanium	29.5 (≤ 20) 22.9 (≤ 20) 29.1 (≤ 20)	- - -	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) were within QC limits.

IX. Internal Standards

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

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

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0905348	All analytes reported below the PQL.	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 SA161-25B and SA161009-25B 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)	Flags	A or P
	SA161-25B	SA161009-25B				
Aluminum	9580	10300	7 (≤ 50)	-	-	-
Antimony	0.8	0.9	-	0.1 (≤ 2.2)	-	-
Arsenic	10.9	9.98	9 (≤ 50)	-	-	-
Barium	105	98.2	7 (≤ 50)	-	-	-
Beryllium	0.278	0.269	3 (≤ 50)	-	-	-
Boron	18.3	19.4	-	1.1 (≤ 10.8)	-	-
Cadmium	0.24	0.22	-	0.02 (≤ 0.11)	-	-
Calcium	22800	19800	14 (≤ 50)	-	-	-
Chromium	46.3	47.7	3 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA161-25B	SA161009-25B				
Cobalt	4.1	4.0	-	0.1 (≤ 2.2)	-	-
Copper	12.0	12.1	1 (≤ 50)	-	-	-
Iron	9160	10500	14 (≤ 50)	-	-	-
Lead	5.3	6.4	-	1.1 (≤ 2.2)	-	-
Magnesium	20100	21600	7 (≤ 50)	-	-	-
Manganese	103	110	7 (≤ 50)	-	-	-
Mercury	0.019	0.019	-	0 (≤ 0.019)	-	-
Molybdenum	0.41	0.50	-	0.09 (≤ 0.33)	-	-
Nickel	9.96	10.7	7 (≤ 50)	-	-	-
Platinum	0.009	0.007	-	0.002 (≤ 0.11)	-	-
Potassium	2410	2640	9 (≤ 50)	-	-	-
Selenium	0.8	1.3	-	0.5 (≤ 4.3)	-	-
Sodium	10500	11100	6 (≤ 50)	-	-	-
Strontium	1200	1020	16 (≤ 50)	-	-	-
Thallium	0.164	0.163	1 (≤ 50)	-	-	-
Tin	3.6	4.3	-	0.7 (≤ 10.8)	-	-
Titanium	476	555	15 (≤ 50)	-	-	-
Tungsten	0.22	0.19	-	0.03 (≤ 0.11)	-	-
Uranium	6.38	5.88	8 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA161-25B	SA161009-25B				
Vanadium	32.2	35.3	9 (≤ 50)	-	-	-
Zinc	21.7	23.2	7 (≤ 50)	-	-	-

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0905348**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905348	SA117-0.5B SA117-9B SA117-25B SA117-41B SA161-0.5B SA161-10B SA161-25B SA161009-25B SA161-37B	Antimony Selenium Tungsten	J- (all detects) UJ (all non-detects)	A	Matrix spike analysis (%R) (m)
R0905348	SA117-0.5B SA117-9B SA117-25B SA117-41B SA161-0.5B SA161-10B SA161-25B SA161009-25B SA161-37B	Manganese	J+ (all detects)	A	Matrix spike analysis (%R) (m)
R0905348	SA117-0.5B SA117-9B SA117-25B SA117-41B SA161-0.5B SA161-10B SA161-25B SA161009-25B SA161-37B	Calcium Nickel Titanium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (ld)
R0905348	SA117-0.5B SA117-9B SA117-25B SA117-41B SA161-0.5B SA161-10B SA161-25B SA161009-25B SA161-37B	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0905348**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905348	EB091809-SO1	Aluminum Boron Strontium Tungsten	50.0U ug/L 50.0U ug/L 10.0U ug/L 0.10U ug/L	A	bl
R0905348	SA117-0.5B	Boron Strontium Tin Mercury	10.6U mg/Kg 213U mg/Kg 10.6U mg/Kg 0.016U mg/Kg	A	bl
R0905348	SA117-9B	Boron Selenium Tin Mercury	10.8U mg/Kg 4.3U mg/Kg 10.8U mg/Kg 0.016U mg/Kg	A	bl
R0905348	SA117-25B	Boron Tin Mercury	10.8U mg/Kg 10.8U mg/Kg 0.016U mg/Kg	A	bl
R0905348	SA117-41B	Boron Tin Mercury	11.5U mg/Kg 11.5U mg/Kg 0.017U mg/Kg	A	bl
R0905348	SA161-0.5B	Boron Tin	10.8U mg/Kg 10.8U mg/Kg	A	bl
R0905348	SA161-10B	Boron Tin Mercury	10.7U mg/Kg 10.7U mg/Kg 0.015U mg/Kg	A	bl
R0905348	SA161-25B	Selenium Tin Mercury	4.3U mg/Kg 10.8U mg/Kg 0.020U mg/Kg	A	bl
R0905348	SA161009-25B	Selenium Tin	4.3U mg/Kg 10.8U mg/Kg	A	bl
R0905348	SA161-37B	Tin Mercury	10.4U mg/Kg 0.021U mg/Kg	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Equipment Blank Data Qualification Summary - SDG R0905348**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905348	SA117-0.5B	Boron Strontium	10.6U mg/Kg 213U mg/Kg	A	be
R0905348	SA117-9B	Boron	10.8U mg/Kg	A	be
R0905348	SA117-25B	Boron	10.8U mg/Kg	A	be
R0905348	SA117-41B	Boron	11.5U mg/Kg	A	be
R0905348	SA161-0.5B	Boron	10.8U mg/Kg	A	be
R0905348	SA161-10B	Boron	10.7U mg/Kg	A	be

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0905348**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905348	SA117-0.5B	Strontium	213U mg/Kg	A	bf

Tronox Northgate Henderson

LDC #: 21991K4
 SDG #: R0905348
 Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 11-25-09

Page: 1 of 1

Reviewer: CR
 2nd Reviewer: [Signature]

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

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: 9/18/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	↑	
VI.	Matrix Spike Analysis	SW	MS
VII.	Duplicate Sample Analysis	SW	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(8,9)
XV.	Field Blanks	SW	EB=1, FB= FB072909-SO(S06 & R010) 226

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	EB091809-SO1	SW	11	SA117-0.5BMS	S	21		31	PBW
2	SA117-0.5B	S	12	SA117-0.5BDUP	↓	22		32	PBS
3	SA117-9B		13	SA117-9BMS		23		33	
4	SA117-25B		14	SA117-9BDUP	↓	24		34	
5	SA117-41B		15			25		35	
6	SA161-0.5B		16			26		36	
7	SA161-10B		17			27		37	
8	SA161-25B		18			28		38	
9	SA161009-25B		19			29		39	
10	SA161-37B	↓	20			30		40	

Notes: _____

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	1													
Al			2.9		10.1 / 50.0													
Be			0.10															
B			4.5		2.9 / 50.0													
Co			0.6															
Sr			0.3		2.4 / 10.0													
Ti			0.7															
Tl			0.002															
W		0.02	0.7		0.06 / 0.10													

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All Soil

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	2	3	4	5	6	7	8	9	10
Al	0.8											
B		3.0		6.5 / 10.6	7.9 / 10.8	8.8 / 10.8	9.9 / 11.5	5.6 / 10.8	10.0 / 10.7			
Cr	0.06											
Fe	1.0											
Mg	1.2	2.0										
Mn	0.02											
Hg	0.002			0.013 / 0.06	0.015 / 0.016	0.007 / 0.016	0.010 / 0.017		0.010 / 0.015	0.019 / 0.020	0.009 / 0.014	
Se	0.9				1.0 / 4.3					0.8 / 4.3	1.3 / 4.3	
Sr	0.02	0.10		161 / 213								
Sn	3.3			3.3 / 10.6	4.1 / 10.8	3.8 / 10.8	4.4 / 11.5	4.0 / 10.8	3.9 / 10.7	3.6 / 10.8	4.3 / 10.8	3.7 / 10.4

Reason Code: bl

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

DC #: 21991K4
 SDG #: See Cover
 METHOD: Trace metals (EPA SW 846 Method 6010B/6020/7000)
 Soil preparation factor applied: 200x x 5xdlil
 Sample Concentration units, unless otherwise noted: mg/Kg
 Associated Samples: 6

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Ba			0.50		
Mn			0.10		

Sample Concentration units, unless otherwise noted: mg/Kg
 Associated Samples: 2, 5, 7-10

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mn			0.30		

Sample Concentration units, unless otherwise noted: mg/Kg
 Associated Samples: 2, 6-10

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
W			0.084		
U			0.037		

Sample Concentration units, unless otherwise noted: mg/Kg
 Associated Samples: 3-5

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
W			0.083		

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

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: Trace Metals (EPA SW846 6010B/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: 9/18/09 **Soil factor applied:** 200x

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

Reason Code: be

Associated Samples: All Soil

Analyte	Blank ID	Sample Identification						
		1	2	3	4	5	6	7
Al	10.1							
Ba	0.4							
B	2.9		6.5 / 10.6	7.9 / 10.8	8.8 / 10.8	9.9 / 11.5	5.6 / 10.8	10.0 / 10.7
Ca	291							
Cr	0.8							
Fe	35.2							
Pb	0.086							
Mg	37.3							
Mn	5.6							
K	60							
Na	134							
Sr	2.4		161 / 213					
W	0.06							
U	0.004							
Zn	6.2							

LDC 21991K4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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 (Parent Only)
	8	9	RPD	Difference	Limits	
Aluminum	9580	10300	7			
Antimony	0.8	0.9		0.1	(-2.2)	
Arsenic	10.9	9.98	9			
Barium	105	93.2	7			
Beryllium	0.278	0.269	3			
Boron	18.3	19.4		1.1	(-10.8)	
Cadmium	0.24	0.22		0.02	(<0.11)	
Calcium	22800	19800	14			
Chromium	46.3	47.7	3			
Cobalt	4.1	4.0		0.1	(-2.2)	
Copper	12.0	12.1	1			
Iron	9160	10500	14			
Lead	5.3	6.4		1.1	(-2.2)	
Magnesium	20100	21600	7			
Manganese	103	110	7			
Mercury	0.019	0.019		0	(≤0.019)	
Molybdenum	0.41	0.50		0.09	(-0.33)	
Nickel	9.96	10.7	7			
Platinum	0.009	0.007		0.002	(-0.11)	

LDC#: 21991K4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 2
 Reviewer: CR
 2nd Reviewer: ✓

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

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 (Parent Only)
	8	9	RPD	Difference	Limits	
Potassium	2410	2640	9			
Selenium	0.8	1.3		0.5	(- 4.3)	
Sodium	10500	11100	6			
Strontium	1200	1020	16			
Thallium	0.164	0.163	1			
Tin	3.6	4.3		0.7	(- 10.8)	
Titanium	47.8	55.5	15			
Tungsten	0.22	0.19		0.03	(- 0.11)	
Uranium	6.36	5.88	8			
Vanadium	32.2	35.3	9			
Zinc	21.7	23.2	7			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 21, 2009

LDC Report Date: November 19, 2009

Matrix: Soil

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0905387

Sample Identification

SA32-0.5B
SA32-9B
SA32-25B
SA32009-25B
SA32-37B
SA66-0.5B
SA66009-0.5B
SA66-10B
SA66-28B
SA129-10B
SA129-29B
RSAT4-0.5B
RSAT4-10B
RSAT4-25B
RSAT4-40B
RSAT4-53B
SA32-0.5BMS
SA32-0.5BDUP

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, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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)	Aluminum Antimony Chromium Iron Magnesium Manganese Mercury Selenium Tin Tungsten	0.9 mg/Kg 0.5 mg/Kg 0.07 mg/Kg 2.1 mg/Kg 0.7 mg/Kg 0.02 mg/Kg 0.003 mg/Kg 0.8 mg/Kg 3.8 mg/Kg 0.022 mg/Kg	All samples in SDG R0905387
ICB/CCB	Barium Boron Magnesium Manganese Uranium	0.50 ug/L 3.0 ug/L 2.0 ug/L 0.20 ug/L 0.037 ug/L	All samples in SDG R0905387
ICB/CCB	Aluminum	2.0 ug/L	SA129-29B RSAT4-0.5B RSAT4-10B RSAT4-25B RSAT4-40B RSAT4-53B

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Beryllium Tungsten	0.010 ug/L 0.056 ug/L	RSAT4-25B RSAT4-40B RSAT4-53B
ICB/CCB	Beryllium	0.006 ug/L	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B RSAT4-0.5B RSAT4-10B
ICB/CCB	Strontium	0.10 ug/L	SA32-0.5B SA129-29B RSAT4-0.5B RSAT4-10B RSAT4-25B RSAT4-40B RSAT4-53B
ICB/CCB	Tungsten	0.054 ug/L	SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B RSAT4-0.5B RSAT4-10B
ICB/CCB	Tungsten	0.053 ug/L	SA32-0.5B SA32-9B SA32-25B

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
SA32-0.5B	Antimony Tin	1.6 mg/Kg 5.0 mg/Kg	2.2U mg/Kg 11.0U mg/Kg
SA32-9B	Antimony Selenium Tin	1.4 mg/Kg 1.0 mg/Kg 4.0 mg/Kg	2.2U mg/Kg 4.4U mg/Kg 10.9U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA32-25B	Antimony Mercury Tin	0.9 mg/Kg 0.009 mg/Kg 4.0 mg/Kg	2.3U mg/Kg 0.021U mg/Kg 11.3U mg/Kg
SA32009-25B	Antimony Mercury Selenium Tin	1.5 mg/Kg 0.010 mg/Kg 1.1 mg/Kg 3.9 mg/Kg	2.2U mg/Kg 0.020U mg/Kg 4.5U mg/Kg 11.2U mg/Kg
SA32-37B	Antimony Mercury Selenium Tin	1.9 mg/Kg 0.010 mg/Kg 0.9 mg/Kg 3.9 mg/Kg	2.3U mg/Kg 0.022U mg/Kg 4.5U mg/Kg 11.2U mg/Kg
SA66-0.5B	Antimony Boron Tin	1.3 mg/Kg 5.3 mg/Kg 5.5 mg/Kg	2.2U mg/Kg 10.8U mg/Kg 10.8U mg/Kg
SA66009-0.5B	Antimony Boron Mercury Tin	1.8 mg/Kg 6.8 mg/Kg 0.014 mg/Kg 4.9 mg/Kg	2.2U mg/Kg 10.8U mg/Kg 0.019U mg/Kg 10.8U mg/Kg
SA66-10B	Antimony Boron Mercury Tin	1.4 mg/Kg 7.4 mg/Kg 0.017 mg/Kg 3.8 mg/Kg	2.2U mg/Kg 10.9U mg/Kg 0.019U mg/Kg 10.9U mg/Kg
SA66-28B	Antimony Mercury Tin	1.4 mg/Kg 0.009 mg/Kg 3.8 mg/Kg	2.0U mg/Kg 0.021U mg/Kg 10.2U mg/Kg
SA129-10B	Antimony Boron Tin	1.8 mg/Kg 8.3 mg/Kg 4.2 mg/Kg	2.2U mg/Kg 10.8U mg/Kg 10.8U mg/Kg
SA129-29B	Antimony Boron Mercury Selenium Tin	1.5 mg/Kg 8.0 mg/Kg 0.010 mg/Kg 0.8 mg/Kg 3.7 mg/Kg	2.3U mg/Kg 11.4U mg/Kg 0.019U mg/Kg 4.6U mg/Kg 11.4U mg/Kg
RSAT4-0.5B	Antimony Boron Tin	1.1 mg/Kg 8.5 mg/Kg 3.5 mg/Kg	2.1U mg/Kg 10.4U mg/Kg 10.4U mg/Kg
RSAT4-10B	Antimony Boron Tin	1.8 mg/Kg 8.9 mg/Kg 3.4 mg/Kg	2.1U mg/Kg 10.7U mg/Kg 10.7U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
RSAT4-25B	Antimony Boron Tin	0.9 mg/Kg 9.2 mg/Kg 3.6 mg/Kg	2.1U mg/Kg 10.6U mg/Kg 10.6U mg/Kg
RSAT4-40B	Antimony Mercury Tin	1.1 mg/Kg 0.017 mg/Kg 4.2 mg/Kg	2.4U mg/Kg 0.018U mg/Kg 12.0U mg/Kg
RSAT4-53B	Antimony Mercury Tin	1.0 mg/Kg 0.011 mg/Kg 3.3 mg/Kg	1.9U mg/Kg 0.017U mg/Kg 9.2U mg/Kg

Samples FB072909-SO (from SDG R0904226) and FB080309-SO (from SDG R0904279) were identified as field blanks. No metal contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB072909-SO	7/29/09	Aluminum Barium Calcium Copper Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Uranium Zinc	8.1 ug/L 1.0 ug/L 582 ug/L 0.8 ug/L 12.1 ug/L 0.359 ug/L 28.4 ug/L 4.3 ug/L 160 ug/L 1.4 ug/L 0.5 ug/L 0.03 ug/L 0.006 ug/L 10.0 ug/L	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B
FB080309-SO	8/3/09	Aluminum Barium Calcium Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Zinc	18.6 ug/L 0.8 ug/L 113 ug/L 136 ug/L 0.042 ug/L 33.6 ug/L 7.5 ug/L 66.0 ug/L 1.0 ug/L 1.5 ug/L 0.04 ug/L 0.8 ug/L	RSAT4-0.5B RSAT4-10B RSAT4-25B RSAT4-40B RSAT4-53B

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

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
SA32-0.5BMS (SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B)	Antimony Tungsten	60.6 (75-125) 64.1 (75-125)	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A

VII. Duplicate Sample Analysis

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	RPD (Limits)	Difference (Limits)	Flag	A or P
SA32-0.5BDUP (SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B)	Calcium Copper Iron Lead Nickel Potassium Titanium	33.3 (≤ 20) 24.2 (≤ 20) 21.1 (≤ 20) 23.2 (≤ 20) 27.7 (≤ 20) 22.6 (≤ 20) 22.6 (≤ 20)	- - - - - - -	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) were within QC limits.

IX. Internal Standards

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. 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
SA32-0.5BL	Aluminum Calcium Iron Manganese Nickel	10.5 (≤10) 10.4 (≤10) 11.6 (≤10) 11.8 (≤10) 12.2 (≤10)	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0905387	All analytes reported below the PQL.	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 SA32-25B and SA32009-25B and samples SA66-0.5B and SA66009-0.5B 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)	Flags	A or P
	SA32-25B	SA32009-25B				
Aluminum	10300	9610	7 (≤ 50)	-	-	-
Antimony	0.9	1.5	-	0.6 (≤ 2.3)	-	-
Arsenic	17	15.9	7 (≤ 50)	-	-	-
Barium	82.1	103	23 (≤ 50)	-	-	-
Beryllium	0.407	0.387	5 (≤ 50)	-	-	-
Boron	23.8	21.1	-	2.7 (≤ 11.3)	-	-
Cadmium	0.27	0.22	-	0.05 (≤ 0.11)	-	-
Calcium	34400	37700	9 (≤ 50)	-	-	-
Chromium	15.6	13.5	14 (≤ 50)	-	-	-
Cobalt	4.4	5	-	0.6 (≤ 2.3)	-	-
Copper	13.5	14.9	10 (≤ 50)	-	-	-
Iron	9930	10900	9 (≤ 50)	-	-	-
Lead	7.2	6.3	-	0.9 (≤ 2.3)	-	-
Magnesium	18400	16700	10 (≤ 50)	-	-	-
Manganese	195	206	5 (≤ 50)	-	-	-
Mercury	0.009	0.01	-	0.001 (≤ 0.021)	-	-
Molybdenum	1.01	1.14	-	0.13 (≤ 0.34)	-	-
Nickel	10.5	11.3	7 (≤ 50)	-	-	-
Platinum	0.011	0.011	-	0 (≤ 0.11)	-	-
Potassium	5260	5090	3 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA32-25B	SA32009-25B				
Selenium	0.8U	1.1	-	0.3 (≤ 4.5)	-	-
Sodium	570	573	1 (≤ 50)	-	-	-
Strontium	641	804	23 (≤ 50)	-	-	-
Thallium	0.129	0.114	12 (≤ 50)	-	-	-
Tin	4	3.9	-	0.1 (≤ 11.3)	-	-
Titanium	519	546	5 (≤ 50)	-	-	-
Tungsten	0.48	0.42	-	0.06 (≤ 0.11)	-	-
Uranium	3.94	3.66	7 (≤ 50)	-	-	-
Vanadium	35.2	39	10 (≤ 50)	-	-	-
Zinc	25.6	25.6	0 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA66-0.5B	SA66009-0.5B				
Aluminum	6830	7000	2 (≤ 50)	-	-	-
Antimony	1.3	1.8	-	0.5 (≤ 2.2)	-	-
Arsenic	0.97	1.18	-	0.21 (≤ 0.54)	-	-
Barium	219	169	26 (≤ 50)	-	-	-
Beryllium	0.305	0.316	4 (≤ 50)	-	-	-
Boron	5.3	6.8	-	1.5 (≤ 10.8)	-	-
Cadmium	0.69	0.77	11 (≤ 50)	-	-	-
Calcium	18700	16900	10 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA66-0.5B	SA66009-0.5B				
Chromium	5.2	6.48	22 (≤ 50)	-	-	-
Cobalt	9.6	8.8	-	0.8 (≤ 2.2)	-	-
Copper	37.2	35.8	4 (≤ 50)	-	-	-
Iron	14700	15400	5 (≤ 50)	-	-	-
Lead	334	350	5 (≤ 50)	-	-	-
Magnesium	8590	9350	8 (≤ 50)	-	-	-
Manganese	268	362	30 (≤ 50)	-	-	-
Mercury	0.024	0.014	-	0.01 (≤ 0.019)	-	-
Molybdenum	0.86	0.6	-	0.26 (≤ 0.32)	-	-
Nickel	23.4	26.3	12 (≤ 50)	-	-	-
Platinum	0.019	0.019	-	0 (≤ 0.11)	-	-
Potassium	1420	1640	14 (≤ 50)	-	-	-
Sodium	4310	2820	42 (≤ 50)	-	-	-
Strontium	134	119	-	15 (≤ 43.2)	-	-
Thallium	0.197	0.169	15 (≤ 50)	-	-	-
Tin	5.5	4.9	-	0.6 (≤ 10.8)	-	-
Titanium	1050	932	12 (≤ 50)	-	-	-
Tungsten	0.14	0.17	-	0.03 (≤ 0.11)	-	-
Uranium	1.22	1.11	9 (≤ 50)	-	-	-
Vanadium	38.3	43.5	13 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA66-0.5B	SA66009-0.5B				
Zinc	42.4	40.2	5 (≤ 50)	-	-	-

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0905387**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905387	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B	Antimony Tungsten	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike analysis (%R) (m)
R0905387	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B	Calcium Copper Iron Lead Nickel Potassium Titanium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (ld)
R0905387	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B	Aluminum Calcium Iron Manganese Nickel	J (all detects) UJ (all non-detects)	A	ICP serial dilution (%D) (sd)
R0905387	SA32-0.5B SA32-9B SA32-25B SA32009-25B SA32-37B SA66-0.5B SA66009-0.5B SA66-10B SA66-28B SA129-10B SA129-29B RSAT4-0.5B RSAT4-10B RSAT4-25B RSAT4-40B RSAT4-53B	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0905387**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905387	SA32-0.5B	Antimony Tin	2.2U mg/Kg 11.0U mg/Kg	A	bl
R0905387	SA32-9B	Antimony Selenium Tin	2.2U mg/Kg 4.4U mg/Kg 10.9U mg/Kg	A	bl
R0905387	SA32-25B	Antimony Mercury Tin	2.3U mg/Kg 0.021U mg/Kg 11.3U mg/Kg	A	bl
R0905387	SA32009-25B	Antimony Mercury Selenium Tin	2.2U mg/Kg 0.020U mg/Kg 4.5U mg/Kg 11.2U mg/Kg	A	bl
R0905387	SA32-37B	Antimony Mercury Selenium Tin	2.3U mg/Kg 0.022U mg/Kg 4.5U mg/Kg 11.2U mg/Kg	A	bl
R0905387	SA66-0.5B	Antimony Boron Tin	2.2U mg/Kg 10.8U mg/Kg 10.8U mg/Kg	A	bl
R0905387	SA66009-0.5B	Antimony Boron Mercury Tin	2.2U mg/Kg 10.8U mg/Kg 0.019U mg/Kg 10.8U mg/Kg	A	bl
R0905387	SA66-10B	Antimony Boron Mercury Tin	2.2U mg/Kg 10.9U mg/Kg 0.019U mg/Kg 10.9U mg/Kg	A	bl
R0905387	SA66-28B	Antimony Mercury Tin	2.0U mg/Kg 0.021U mg/Kg 10.2U mg/Kg	A	bl
R0905387	SA129-10B	Antimony Boron Tin	2.2U mg/Kg 10.8U mg/Kg 10.8U mg/Kg	A	bl
R0905387	SA129-29B	Antimony Boron Mercury Selenium Tin	2.3U mg/Kg 11.4U mg/Kg 0.019U mg/Kg 4.6U mg/Kg 11.4U mg/Kg	A	bl

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905387	RSAT4-0.5B	Antimony Boron Tin	2.1U mg/Kg 10.4U mg/Kg 10.4U mg/Kg	A	bl
R0905387	RSAT4-10B	Antimony Boron Tin	2.1U mg/Kg 10.7U mg/Kg 10.7U mg/Kg	A	bl
R0905387	RSAT4-25B	Antimony Boron Tin	2.1U mg/Kg 10.6U mg/Kg 10.6U mg/Kg	A	bl
R0905387	RSAT4-40B	Antimony Mercury Tin	2.4U mg/Kg 0.018U mg/Kg 12.0U mg/Kg	A	bl
R0905387	RSAT4-53B	Antimony Mercury Tin	1.9U mg/Kg 0.017U mg/Kg 9.2U mg/Kg	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0905387**

No Sample Data Qualified in this SDG

LDC #: 21991L4
 SDG #: R0905387
 Laboratory: Columbia Analytical Services

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
 Stage 2B

Date: 11-17-09
 Page: 6 of 1
 Reviewer: CR
 2nd Reviewer: W

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

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: 9/21/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	SW MS	
VII.	Duplicate Sample Analysis	SW Dup	
VIII.	Laboratory Control Samples (LCS)	A LCS	
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	SW	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW (3,4), (6,7)	
XV.	Field Blanks	SW	FB=FB072909-S0, FB080309-S0 (506W R0904226), (506W R0904279)

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:
 Soil

1	SA32-0.5B	11	SA129-29B	21	PPS	31
2	SA32-9B	12	RSAT4-0.5B	22		32
3	SA32-25B	13	RSAT4-10B	23		33
4	SA32009-25B	14	RSAT4-25B	24		34
5	SA32-37B	15	RSAT4-10B 40B	25		35
6	SA66-0.5B	16	RSAT4-53B	26		36
7	SA66009-0.5B	17	SA32-0.5BMS	27		37
8	SA66-10B	18	SA32-0.5BDUP	28		38
9	SA66-28B	19		29		39
10	SA129-10B	20		30		40

Notes: _____

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

DC #: 21991L4
 DG #: See Cover
 METHOD: Trace metals (EPA SW 846 Method 6010B/6020/7000)
 Sample Concentration units, unless otherwise noted: mg/Kg

Reason Code: bl
 Soil preparation factor applied: 200x
 Associated Samples: 1-13

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Quals.						
Be		0.006								

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 1-11-16

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Quals.						
Sr		0.10								

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 4-13

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Quals.						
W		0.054								

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 1-3

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Quals.						
W		0.053								

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

21991L4.wpd

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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	10300	9610	7			
Antimony	0.9	1.5		0.6	(≤2.3)	
Arsenic	17.0	15.9	7			
Barium	82.1	103	23			
Beryllium	0.407	0.387	5			
Boron	23.8	21.1		2.7	(≤11.3)	
Cadmium	0.27	0.22		0.05	(≤0.11)	
Calcium	34400	37700	9			
Chromium	15.6	13.5	14			
Cobalt	4.4	5.0		0.6	(≤2.3)	
Copper	13.5	14.9	10			
Iron	9930	10900	9			
Lead	7.2	6.3		0.9	(≤2.3)	
Magnesium	18400	16700	10			
Manganese	195	206	5			
Mercury	0.009	0.010		0.001	(≤0.021)	
Molybdenum	1.01	1.14		0.13	(≤0.34)	
Nickel	10.5	11.3	7			
Platinum	0.011	0.011		0	(≤0.11)	

LDC#: 21991L4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 4
 Reviewer: CR
 2nd Reviewer: W

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

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 (Parent Only)
	3	4	RPD	Difference	Limits	
Potassium	5260	5090	3	170 CR	(≤) CR	
Selenium	0.8U	1.1		0.3	(≤4.5)	
Sodium	570	573	1			
Strontium	641	804	23			
Thallium	0.129	0.114	12			
Tin	4.0	3.9		0.1	(≤11.3)	
Titanium	519	546	5			
Tungsten	0.48	0.42		0.06	(≤0.11)	
Uranium	3.94	3.66	7			
Vanadium	35.2	39.0	10			
Zinc	25.6	25.6	0			

V:\FIELD DUPLICATES\FD_inorganic\21991L4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	6	7	RPD	Difference	Limits	
Aluminum	6830	7000	2			
Antimony	1.3	1.8		0.5	(≤2.2)	
Arsenic	0.97	1.18	σ CR	0.21	(≤0.54)	
Barium	219	169	26			
Beryllium	0.305	0.316	4			

LDC#: 21991L4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 3 of 4
 Reviewer: OR
 2nd Reviewer: W

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

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)
	6	7				
Boron	5.3	6.8		1.5	(<10.8)	
Cadmium	0.69	0.77	11			
Calcium	18700	16900	10			
Chromium	5.20	6.48	22			
Cobalt	9.6	8.8		0.8	(<2.2)	
Copper	37.2	35.8	4			
Iron	14700	15400	5			
Lead	334	350	5			
Magnesium	8590	9350	8			
Manganese	268	362	30			
Mercury	0.024	0.014		0.01	(<0.019)	
Molybdenum	0.86	0.60	<u>38</u> <u>OR</u>	0.26	(<0.32)	
Nickel	23.4	26.3	12			
Platinum	0.019	0.019		0	(<0.11)	
Potassium	1420	1640	14			
Sodium	4310	2820	42			
Strontium	134	119		15	(<43.2)	
Thallium	0.197	0.169	15			

LDC#: 21991L4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 4 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	6	7	RPD	Difference	Limits	
Tin	5.5	4.9		0.6	(<10.8)	
Titanium	1050	932	12			
Tungsten	0.14	0.17		0.03	(≤0.11)	
Uranium	1.22	1.11	9			
Vanadium	38.3	43.5	13			
Zinc	42.4	40.2	5			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 24 through September 25, 2009

LDC Report Date: November 18, 2009

Matrix: Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0905462

Sample Identification

M-89B
M-2AB
M-2009AB
FiltB092509-A2
M-89BMS
M-89BDUP
M-2ABMS
M-2ABDUP

Introduction

This data review covers 8 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, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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	Antimony Boron Cobalt Copper Lead Manganese Sodium Strontium Thallium Tungsten Uranium	0.050 ug/L 5.5 ug/L 0.5 ug/L 0.8 ug/L 0.007 ug/L 0.2 ug/L 149 ug/L 0.1 ug/L 0.007 ug/L 0.08 ug/L 0.004 ug/L	All samples in SDG R0905462

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
M-89B	Thallium	0.185 ug/L	0.200U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
M-2AB	Copper Manganese Thallium	9.8 ug/L 1.6 ug/L 0.113 ug/L	10.0U ug/L 5.0U ug/L 0.200U ug/L
M-2009AB	Copper Manganese Thallium	9.9 ug/L 1.2 ug/L 0.117 ug/L	10.0U ug/L 5.0U ug/L 0.200U ug/L
FiltB092509-A2	Boron Lead Manganese Strontium Tungsten	11.0 ug/L 0.006 ug/L 0.6 ug/L 0.2 ug/L 0.02 ug/L	50.0U ug/L 0.020U ug/L 5.0U ug/L 10.0U ug/L 0.10U ug/L

Sample FB080409-SO (from SDG R0904290) was identified as a field blank. No metal contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB080409-SO	8/4/09	Boron Chromium Copper Tungsten	9.0 ug/L 0.9 ug/L 0.8 ug/L 0.01 ug/L	M-89B M-2AB M-2009AB

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
M-2AB	Copper Tungsten	9.8 ug/L 0.82 ug/L	10.0U ug/L 1.00U ug/L
M-2009AB	Copper	9.9 ug/L	10.0U ug/L

Sample FiltB092509-A2 was identified as a filter blank. No metal contaminants were found in this blank with the following exceptions:

Filter Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FltB092509-A2	9/25/09	Boron Calcium Lead Magnesium Manganese Sodium Strontium Tungsten Zinc	11.0 ug/L 34 ug/L 0.006 ug/L 3.8 ug/L 0.6 ug/L 398 ug/L 0.2 ug/L 0.02 ug/L 3.6 ug/L	No associated samples in this SDG

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Duplicate Sample Analysis

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

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. 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
M-2ABL	Uranium	21 (≤ 10)	M-89B M-2AB M-2009AB	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0905462	All analytes reported below the PQL.	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 M-2AB and M-2009AB were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-2AB	M-2009AB				
Aluminum	70.4	62.3	-	8.1 (≤ 50.0)	-	-
Barium	50.8	51.3	1 (≤ 50)	-	-	-
Boron	3290	3310	1 (≤ 50)	-	-	-
Calcium	598000	603000	1 (≤ 50)	-	-	-
Chromium	19900	19800	1 (≤ 50)	-	-	-
Copper	9.8	9.9	-	0.1 (≤ 10.0)	-	-
Iron	45.9	46.9	-	1 (≤ 20.0)	-	-
Magnesium	333000	338000	1 (≤ 50)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-2AB	M-2009AB				
Manganese	1.6	1.2	-	0.4 (≤ 5.0)	-	-
Molybdenum	26	25.5	2 (≤ 50)	-	-	-
Nickel	4.4	5.4	-	1 (≤ 2.0)	-	-
Platinum	0.08	0.1	-	0.02 (≤ 1.00)	-	-
Potassium	32800	32500	1 (≤ 50)	-	-	-
Sodium	1960000	1910000	3 (≤ 50)	-	-	-
Strontium	18300	18000	2 (≤ 50)	-	-	-
Thallium	0.113	0.117	-	0.004 (≤ 0.200)	-	-
Tungsten	0.82	1.08	-	0.26 (≤ 1.00)	-	-
Uranium	19.5	18.8	4 (≤ 50)	-	-	-
Vanadium	23.7	23.8	0 (≤ 50)	-	-	-
Zinc	0.8	1.6	-	0.8 (≤ 10.0)	-	-

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0905462**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905462	M-89B M-2AB M-2009AB	Uranium	J (all detects) UJ (all non-detects)	A	ICP serial dilution (%D) (sd)
R0905462	M-89B M-2AB M-2009AB FiltB092509-A2	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0905462**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905462	M-89B	Thallium	0.200U ug/L	A	bl
R0905462	M-2AB	Copper Manganese Thallium	10.0U ug/L 5.0U ug/L 0.200U ug/L	A	bl
R0905462	M-2009AB	Copper Manganese Thallium	10.0U ug/L 5.0U ug/L 0.200U ug/L	A	bl
R0905462	FiltB092509-A2	Boron Lead Manganese Strontium Tungsten	50.0U ug/L 0.020U ug/L 5.0U ug/L 10.0U ug/L 0.10U ug/L	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0905462**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905462	M-2AB	Copper Tungsten	10.0U ug/L 1.00U ug/L	A	bf
R0905462	M-2009AB	Copper	10.0U ug/L	A	bf

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Filter Blank Data Qualification Summary - SDG R0905462**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 21991M4

VALIDATION COMPLETENESS WORKSHEET

SDG #: R0905462

Stage 2B

Laboratory: Columbia Analytical Services

Date: 11/17/09

Page: 1 of 1

Reviewer: CR

2nd Reviewer: W

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

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: 9/24/09 - 9/25/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	SW	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(2,3)
XV.	Field Blanks	SW	Filter Blank = 4, FB = FB080409-GW (506# R0904200)

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: water

1	M-89B	11	FBW	21		31	
2	M-2AB	12		22		32	
3	M-2009AB	13		23		33	
4	FiltB092509-A2	14		24		34	
5	M-89BMS	15		25		35	
6	M-89BDUP	16		26		36	
7	M-2ABMS	17		27		37	
8	M-2ABDUP	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
 Associated Samples: All

Reason Code: bl

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	Associated Samples				
					1	2	3	4	
Sb			0.050						
B			5.5				11.0 / 50.0		
Co			0.5						
Cu			0.8		9.8 / 10.0		9.9 / 10.0		
Pb			0.007				0.006 / 0.020		
Mn			0.2		1.6 / 5.0		1.2 / 5.0		
Na			149						
Sr			0.1				0.2 / 10.0		
Tl			0.007		0.185 / 0.200	0.113 / 0.200	0.117 / 0.200		
W			0.08						
U			0.004				0.02 / 0.10		

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

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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 (ug/L)		(≤30)	Difference	Limits	Qualifications (Parent Only)
	2	3	RPD			
Aluminum	70.4	62.3		8.1	(≤50.0)	
Barium	50.8	51.3	1			
Boron	3290	3310	1			
Calcium	598000	603000	1			
Chromium	19900	19800	1			
Copper	9.8	9.9		0.1	(≤10.0)	
Iron	45.9	46.9		1	(≤20.0)	
Magnesium	333000	338000	1			
Manganese	1.6	1.2		0.4	(≤5.0)	
Molybdenum	26.0	25.5	2			
Nickel	4.4	5.4		1	(≤2.0)	
Platinum	0.08	0.10		0.02	(≤1.00)	
Potassium	32800	32500	1			
Sodium	1960000	1910000	3			
Strontium	18300	18000	2			
Thallium	0.113	0.117		0.004	(≤0.200)	
Tungsten	0.82	1.08		0.26	(≤1.00)	
Uranium	19.5	18.8	4			
Vanadium	23.7	23.8	0			

LDC#: 21991M4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (ug/L)		(≤30)	Difference	Limits	Qualifications (Parent Only)
	2	3	RPD			
Zinc	0.8	1.6		0.8	(≤10.0)	

V:\FIELD DUPLICATES\FD_inorganic\21991M4.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 24 through September 25, 2009

LDC Report Date: December 21, 2009

Matrix: Soil/Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0905464

Sample Identification

SA205-0.5B	SA208-0.5B
SA205-10B	SA208-7B
SA205-25B	SA205-0.5BMS
SA205-41B	SA205-0.5BDUP
SA84-0.5B	SA101-0.5BMS
SA84-10B	SA101-0.5BDUP
SA84009-10B	
SA84-25B	
SA84-43B	
EB092509-SO1A2	
EB092509-SO2A4	
SA101-0.5B	
SA101-10B	
SA101-25B	
SA101-42B	
SA121-0.5B	
SA121009-0.5B	
SA121-10B	
SA121-25B	
SA121-44B	

Introduction

This data review covers 24 soil samples and 2 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, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

*IV. 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)	Boron Chromium	2.4 ug/L 0.7 ug/L	All water samples in SDG R0905464
ICB/CCB	Aluminum Barium Boron Calcium Cobalt Magnesium Manganese Molybdenum Strontium Thallium Tungsten Uranium	2.1 ug/L 1.3 ug/L 2.0 ug/L 9.1 ug/L 0.7 ug/L 2.2 ug/L 0.5 ug/L 0.7 ug/L 0.1 ug/L 0.008 ug/L 0.08 ug/L 0.005 ug/L	All water samples in SDG R0905464
PB (prep blank)	Antimony Chromium Tin	0.8 mg/Kg 0.07 mg/Kg 3.6 mg/Kg	All soil samples in SDG R0905464
ICB/CCB	Boron	2.0 ug/L	All soil samples in SDG R0905464

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Barium Titanium	0.80 ug/L 0.03 ug/L	SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B SA208-0.5B SA208-7B
ICB/CCB	Barium	0.60 ug/L	SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B
ICB/CCB	Manganese	0.10 ug/L	SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B SA208-0.5B SA208-7B
ICB/CCB	Sodium	30.0 ug/L	SA205-0.5B
ICB/CCB	Tungsten	0.067 ug/L	SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B SA208-0.5B SA208-7B

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Tungsten	0.057 ug/L	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B
ICB/CCB	Beryllium	0.009 ug/L	SA121-25B

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
EB092509-SO1A2	Aluminum Magnesium Manganese Strontium	4.7 ug/L 11.2 ug/L 2.4 ug/L 0.6 ug/L	50.0U ug/L 20.0U ug/L 5.0U ug/L 10.0U ug/L
EB092509-SO2A4	Aluminum Boron Chromium Manganese Strontium Tungsten	8.5 ug/L 2.1 ug/L 0.6 ug/L 4.7 ug/L 1.4 ug/L 0.02 ug/L	50.0U ug/L 50.0U ug/L 5.0U ug/L 5.0U ug/L 10.0U ug/L 0.10U ug/L
SA205-0.5B	Antimony Boron Tin	1.1 mg/Kg 7.9 mg/Kg 4.3 mg/Kg	2.2U mg/Kg 10.9U mg/Kg 10.9U mg/Kg
SA205-10B	Antimony Boron Tin	1.6 mg/Kg 6.9 mg/Kg 4.4 mg/Kg	2.1U mg/Kg 10.4U mg/Kg 10.4U mg/Kg
SA205-25B	Antimony Boron Tin	1.1 mg/Kg 8.0 mg/Kg 4.4 mg/Kg	2.1U mg/Kg 10.4U mg/Kg 10.4U mg/Kg
SA205-41B	Antimony Tin	1.2 mg/Kg 4.7 mg/Kg	2.2U mg/Kg 10.9U mg/Kg
SA84-0.5B	Tin	6.3 mg/Kg	10.1U mg/Kg

*Indicates change as the result of report review.
SDG R0905464

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA84-10B	Antimony Tin	1.4 mg/Kg 4.3 mg/Kg	2.1U mg/Kg 10.3U mg/Kg
SA84009-10B	Antimony Tin	1.6 mg/Kg 4.5 mg/Kg	2.1U mg/Kg 10.7U mg/Kg
SA84-25B	Antimony Tin	1.1 mg/Kg 4.2 mg/Kg	2.1U mg/Kg 10.3U mg/Kg
SA84-43B	Antimony Tin	1.6 mg/Kg 4.3 mg/Kg	2.3U mg/Kg 11.6U mg/Kg
SA101-0.5B	Antimony Tin	1.5 mg/Kg 4.3 mg/Kg	2.1U mg/Kg 10.3U mg/Kg
SA101-10B	Antimony Boron Tin	1.3 mg/Kg 9.3 mg/Kg 4.5 mg/Kg	2.1U mg/Kg 10.6U mg/Kg 10.6U mg/Kg
SA101-25B	Antimony Tin	1.3 mg/Kg 4.9 mg/Kg	2.4U mg/Kg 11.9U mg/Kg
SA101-42B	Antimony Tin	1.0 mg/Kg 4.9 mg/Kg	2.5U mg/Kg 12.6U mg/Kg
SA121-0.5B	Antimony Boron Tin	1.9 mg/Kg 8.0 mg/Kg 4.1 mg/Kg	2.1U mg/Kg 10.7U mg/Kg 10.7U mg/Kg
SA121009-0.5B	Boron Tin	8.4 mg/Kg 4.7 mg/Kg	10.8U mg/Kg 10.8U mg/Kg
SA121-10B	Antimony Tin	1.4 mg/Kg 4.2 mg/Kg	2.1U mg/Kg 10.7U mg/Kg
SA121-25B	Antimony Tin	1.6 mg/Kg 4.7 mg/Kg	2.2U mg/Kg 11.0U mg/Kg
SA121-44B	Antimony Tin	1.0 mg/Kg 4.2 mg/Kg	2.0U mg/Kg 10.2U mg/Kg
SA208-0.5B	Antimony Boron Tin	1.8 mg/Kg 7.4 mg/Kg 4.6 mg/Kg	2.1U mg/Kg 10.6U mg/Kg 10.6U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA208-7B	Antimony Boron Tin	1.4 mg/Kg 9.3 mg/Kg 4.4 mg/Kg	2.2U mg/Kg 10.8U mg/Kg 10.8U mg/Kg

Samples EB092509-SO1A2 and EB092509-SO2A4 were identified as equipment blanks. No metal contaminants were found in these blanks with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB092509-SO1A2	9/25/09	Aluminum Calcium Iron Magnesium Manganese Potassium Sodium Strontium Tungsten Titanium Zinc	4.7 ug/L 197 ug/L 8.8 ug/L 11.2 ug/L 2.4 ug/L 192 ug/L 112 ug/L 0.6 ug/L 0.78 ug/L 0.4 ug/L 6.4 ug/L	SA208-0.5B SA208-7B
EB092509-SO2A4	9/25/09	Aluminum Boron Calcium Chromium Iron Lead Magnesium Manganese Mercury Potassium Sodium Strontium Titanium Tungsten Zinc	8.5 ug/L 2.1 ug/L 298 ug/L 0.6 ug/L 29.2 ug/L 0.036 ug/L 30.6 ug/L 4.7 ug/L 0.03 ug/L 64 ug/L 83.6 ug/L 1.4 ug/L 0.5 ug/L 0.02 ug/L 2.1 ug/L	SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
*SA208-0.5B	Tungsten	0.14 mg/Kg	0.14J+ mg/Kg
*SA208-7B	Tungsten	0.27 mg/Kg	0.27J+ mg/Kg
SA101-0.5B	Mercury	0.012 mg/Kg	0.018U mg/Kg

*Indicates change as the result of report review.
SDG R0905464

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA101-10B	Boron Mercury	9.3 mg/Kg 0.012 mg/Kg	10.6U mg/Kg 0.018U mg/Kg
SA101-25B	Mercury	0.018 mg/Kg	0.020U mg/Kg
SA101-42B	Mercury	0.004 mg/Kg	0.018U mg/Kg
SA121-0.5B	Boron	8.0 mg/Kg	10.7U mg/Kg
SA121009-0.5B	Boron	8.4 mg/Kg	10.8U mg/Kg
SA121-10B	Mercury	0.006 mg/Kg	0.018U mg/Kg
SA121-25B	Mercury	0.009 mg/Kg	0.023U mg/Kg
SA121-44B	Mercury	0.004 mg/Kg	0.020U mg/Kg

*Removed Boron for samples noted above.

Samples FB072909-SO (from SDG R0904226) and FB080309-SO (from SDG R0904279) were identified as field blanks. No metal contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB072909-SO	7/29/09	Aluminum Barium Calcium Copper Iron Lead Magnesium Manganese Sodium Strontium Titanium Tungsten Uranium Zinc	8.1 ug/L 1.0 ug/L 582 ug/L 0.8 ug/L 12.1 ug/L 0.359 ug/L 28.4 ug/L 4.3 ug/L 160 ug/L 1.4 ug/L 0.5 ug/L 0.03 ug/L 0.006 ug/L 10.0 ug/L	SA208-0.5B SA208-7B

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB080309-SO	8/3/09	Aluminum	18.6 ug/L	SA205-0.5B
		Barium	0.8 ug/L	SA205-10B
		Calcium	113 ug/L	SA205-25B
		Iron	136 ug/L	SA205-41B
		Lead	0.042 ug/L	SA84-0.5B
		Magnesium	33.6 ug/L	SA84-10B
		Manganese	7.5 ug/L	SA84009-10B
		Sodium	66.0 ug/L	SA84-25B
		Strontium	1.0 ug/L	SA84-43B
		Titanium	1.5 ug/L	SA101-0.5B
		Tungsten	0.04 ug/L	SA101-10B
		Zinc	0.8 ug/L	SA101-25B
				SA101-42B
				SA121-0.5B
				SA121009-0.5B
				SA121-10B
				SA121-25B
				SA121-44B

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

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
SA205-0.5BMS (SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B)	Antimony Manganese Selenium Tungsten	49.4 (75-125) 60.5 (75-125) 74.9 (75-125) 70.1 (75-125)	J- (all detects) UJ (all non-detects)	A
SA205-0.5BMS (SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B)	Titanium	126.3 (75-125)	J+ (all detects)	A

VII. Duplicate Sample Analysis

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	RPD (Limits)	Difference (Limits)	Flag	A or P
SA205-0.5BDUP (SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B)	Barium Calcium Chromium Manganese Sodium Strontium Titanium	43.8 (≤ 20) 74.3 (≤ 20) 21.1 (≤ 20) 23.7 (≤ 20) 53.1 (≤ 20) - 21.7 (≤ 20)	- - - - - 130 mg/Kg (≤ 43.4) -	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) were within QC limits.

IX. Internal Standards

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. 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
SA205-0.5BL	Beryllium Iron Manganese Nickel	12 (≤ 10) 11.8 (≤ 10) 10.6 (≤ 10) 13.0 (≤ 10)	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0905464	All analytes reported below the PQL.	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 SA84-10B and SA84009-10B and samples SA121-0.5B and SA121009-0.5B 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)	Flags	A or P
	SA84-10B	SA84009-10B				
Aluminum	7260	9690	29 (≤ 50)	-	-	-
Antimony	1.4	1.6	-	0.2 (≤ 2.1)	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA84-10B	SA84009-10B				
Arsenic	3.81	3.77	1 (≤ 50)	-	-	-
Barium	150	209	33 (≤ 50)	-	-	-
Beryllium	0.512	0.462	10 (≤ 50)	-	-	-
Boron	40.7	54.7	-	14 (≤ 10.7)	-	-
Cadmium	0.12	0.19	-	0.07 (≤ 0.11)	-	-
Calcium	26700	18800	35 (≤ 50)	-	-	-
Chromium	7.68	7.62	1 (≤ 50)	-	-	-
Cobalt	6.4	7.5	-	1.1 (≤ 2.1)	-	-
Copper	15.9	18.8	17 (≤ 50)	-	-	-
Iron	12400	15900	25 (≤ 50)	-	-	-
Lead	8	9.1	-	1.1 (≤ 2.1)	-	-
Magnesium	9200	9550	4 (≤ 50)	-	-	-
Manganese	320	349	9 (≤ 50)	-	-	-
Mercury	0.008	0.01	-	0.002 (≤ 0.016)	-	-
Molybdenum	0.35	0.43	-	0.08 (≤ 0.32)	-	-
Nickel	14.1	16.2	14 (≤ 50)	-	-	-
Platinum	0.01	0.01	-	0 (≤ 0.11)	-	-
Potassium	2000	2590	26 (≤ 50)	-	-	-
Sodium	623	794	24 (≤ 50)	-	-	-
Strontium	178	223	22 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA84-10B	SA84009-10B				
Thallium	0.091	0.091	-	0 (≤ 0.021)	-	-
Tin	4.3	4.5	-	0.2 (≤ 10.7)	-	-
Titanium	543	764	34 (≤ 50)	-	-	-
Tungsten	0.18	0.14	-	0.04 (≤ 0.11)	-	-
Uranium	1.08	1.01	7 (≤ 50)	-	-	-
Vanadium	33.1	46	33 (≤ 50)	-	-	-
Zinc	29.6	33.7	13 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA121-0.5B	SA121009-0.5B				
Aluminum	8960	9010	1 (≤ 50)	-	-	-
Antimony	1.9	2.2	-	0.3 (≤ 2.2)	-	-
Arsenic	2.82	2.35	18 (≤ 50)	-	-	-
Barium	172	188	9 (≤ 50)	-	-	-
Beryllium	0.49	0.412	17 (≤ 50)	-	-	-
Boron	8	8.4	-	0.4 (≤ 10.8)	-	-
Cadmium	0.15	0.17	-	0.02 (≤ 0.11)	-	-
Calcium	30100	28600	5 (≤ 50)	-	-	-
Chromium	9.37	7.4	-	1.97 (≤ 2.2)	-	-
Cobalt	7.4	7	-	0.4 (≤ 2.2)	-	-
Copper	18	19.6	9 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA121-0.5B	SA121009-0.5B				
Iron	15500	15700	1 (≤ 50)	-	-	-
Lead	19.4	12.3	45 (≤ 50)	-	-	-
Magnesium	9220	9530	3 (≤ 50)	-	-	-
Manganese	355	387	9 (≤ 50)	-	-	-
Mercury	0.043	0.041	-	0.002 (≤ 0.019)	-	-
Molybdenum	0.9	0.82	-	0.08 (≤ 0.32)	-	-
Nickel	15.5	16.2	4 (≤ 50)	-	-	-
Platinum	0.011	0.009	-	0.002 (≤ 0.11)	-	-
Potassium	2420	2340	3 (≤ 50)	-	-	-
Sodium	487	481	1 (≤ 50)	-	-	-
Strontium	202	195	-	7 (≤ 43.2)	-	-
Thallium	0.122	0.089	-	0.033 (≤ 0.089)	-	-
Tin	4.1	4.7	-	0.6 (≤ 10.8)	-	-
Titanium	733	744	1 (≤ 50)	-	-	-
Tungsten	0.23	0.18	-	0.05 (≤ 0.11)	-	-
Uranium	0.875	0.766	13 (≤ 50)	-	-	-
Vanadium	43	44.7	4 (≤ 50)	-	-	-
Zinc	37	41.3	11 (≤ 50)	-	-	-

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0905464**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905464	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B	Antimony Manganese Selenium Tungsten	J- (all detects) UJ (all non-detects)	A	Matrix spike analysis (%R) (m)
R0905464	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B	Titanium	J+ (all detects)	A	Matrix spike analysis (%R) (m)

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905464	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B	Barium Calcium Chromium Manganese Sodium Titanium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD) (Id)
R0905464	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B	Strontium	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (Difference) (Id)
R0905464	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B	Beryllium Iron Manganese Nickel	J (all detects) UJ (all non-detects)	A	ICP serial dilution (%D) (sd)

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0905464	SA205-0.5B SA205-10B SA205-25B SA205-41B SA84-0.5B SA84-10B SA84009-10B SA84-25B SA84-43B EB092509-SO1A2 EB092509-SO2A4 SA101-0.5B SA101-10B SA101-25B SA101-42B SA121-0.5B SA121009-0.5B SA121-10B SA121-25B SA121-44B SA208-0.5B SA208-7B	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0905464**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905464	EB092509-SO1A2	Aluminum Magnesium Manganese Strontium	50.0U ug/L 20.0U ug/L 5.0U ug/L 10.0U ug/L	A	bl
R0905464	EB092509-SO2A4	Aluminum Boron Chromium Manganese Strontium Tungsten	50.0U ug/L 50.0U ug/L 5.0U ug/L 5.0U ug/L 10.0U ug/L 0.10U ug/L	A	bl
R0905464	SA205-0.5B	Antimony Boron Tin	2.2U mg/Kg 10.9U mg/Kg 10.9U mg/Kg	A	bl
R0905464	SA205-10B	Antimony Boron Tin	2.1U mg/Kg 10.4U mg/Kg 10.4U mg/Kg	A	bl
R0905464	SA205-25B	Antimony Boron Tin	2.1U mg/Kg 10.4U mg/Kg 10.4U mg/Kg	A	bl

*Indicates change as the result of report review.
SDG R0905464

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905464	SA205-41B	Antimony Tin	2.2U mg/Kg 10.9U mg/Kg	A	bl
R0905464	SA84-0.5B	Tin	10.1U mg/Kg	A	bl
R0905464	SA84-10B	Antimony Tin	2.1U mg/Kg 10.3U mg/Kg	A	bl
R0905464	SA84009-10B	Antimony Tin	2.1U mg/Kg 10.7U mg/Kg	A	bl
R0905464	SA84-25B	Antimony Tin	2.1U mg/Kg 10.3U mg/Kg	A	bl
R0905464	SA84-43B	Antimony Tin	2.3U mg/Kg 11.6U mg/Kg	A	bl
R0905464	SA101-0.5B	Antimony Tin	2.1U mg/Kg 10.3U mg/Kg	A	bl
R0905464	SA101-10B	Antimony Boron Tin	2.1U mg/Kg 10.6U mg/Kg 10.6U mg/Kg	A	bl
R0905464	SA101-25B	Antimony Tin	2.4U mg/Kg 11.9U mg/Kg	A	bl
R0905464	SA101-42B	Antimony Tin	2.5U mg/Kg 12.6U mg/Kg	A	bl
R0905464	SA121-0.5B	Antimony Boron Tin	2.1U mg/Kg 10.7U mg/Kg 10.7U mg/Kg	A	bl
R0905464	SA121009-0.5B	Boron Tin	10.8U mg/Kg 10.8U mg/Kg	A	bl
R0905464	SA121-10B	Antimony Tin	2.1U mg/Kg 10.7U mg/Kg	A	bl
R0905464	SA121-25B	Antimony Tin	2.2U mg/Kg 11.0U mg/Kg	A	bl
R0905464	SA121-44B	Antimony Tin	2.0U mg/Kg 10.2U mg/Kg	A	bl

*Indicates change as the result of report review.
SDG R0905464

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0905464	SA208-0.5B	Antimony Boron Tin	2.1U mg/Kg 10.6U mg/Kg 10.6U mg/Kg	A	bl
R0905464	SA208-7B	Antimony Boron Tin	2.2U mg/Kg 10.8U mg/Kg 10.8U mg/Kg	A	bl

***Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Equipment Blank Data Qualification Summary - SDG R0905464**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
*R0905464	SA208-0.5B	Tungsten	0.14J+ mg/Kg	A	be
*R0905464	SA208-7B	Tungsten	0.27J+ mg/Kg	A	be
R0905464	SA101-0.5B	Mercury	0.018U mg/Kg	A	be
R0905464	SA101-10B	Boron Mercury	10.6U mg/Kg 0.018U mg/Kg	A	be
R0905464	SA101-25B	Mercury	0.020U mg/Kg	A	be
R0905464	SA101-42B	Mercury	0.018U mg/Kg	A	be
R0905464	SA121-0.5B	Boron	10.7U mg/Kg	A	be
R0905464	SA121009-0.5B	Boron	10.8U mg/Kg	A	be
R0905464	SA121-10B	Mercury	0.018U mg/Kg	A	be
R0905464	SA121-25B	Mercury	0.023U mg/Kg	A	be
R0905464	SA121-44B	Mercury	0.020U mg/Kg	A	be

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG R0905464**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 21991N4
 SDG #: R0905464
 Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
 Stage 2B

Date: 11/25/09
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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: 9/24/09-9/25/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	SW	MS
VII.	Duplicate Sample Analysis	SW	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	SW	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(6,7), (16,17)
XV.	Field Blanks	SW	EB=10,11. FB=FB060309-SO, FB072909-S

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	SA205-0.5B	S	11	EB092509-SO2A4	W	21	SA208-0.5B	S	31	PBW
2	SA205-10B		12	SA101-0.5B	S	22	SA208-7B	↓	32	PBS
3	SA205-25B		13	SA101-10B		23	SA205-0.5BMS	↓	33	
4	SA205-41B		14	SA101-25B		24	SA205-0.5BDUP	↓	34	
5	SAB4-0.5B		15	SA101-42B		25	SA101-0.5BMS	↓	35	
6	SAB4-10B		16	SA121-0.5B		26	SA101-0.5BDUP	↓	36	
7	SA84009-10B		17	SA121009-0.5B		27			37	
8	SA84-25B		18	SA121-10B		28			38	
9	SA84-43B		19	SA121-25B		29			39	
10	EB092509-SO1A2	W	20	SA121-44B		30			40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
 Soil preparation factor applied: 200x x 5x dil
 Associated Samples: All Water

Reason Code: bl

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	10		11	
Al			2.1		4.7 / 50.0		8.5 / 50.0	
Ba			1.3					
B		2.4	2.0				2.1 / 50.0	
Ca			9.1					
Cr		0.7					0.6 / 5.0	
Co			0.7					
Mg			2.2		11.2 / 20.0			
Mn			0.5		2.4 / 5.0		4.7 / 5.0	
Mo			0.7					
Sr			0.1		0.6 / 10.0		1.4 / 10.0	
Tl			0.008					
W			0.08				0.02 / 0.10	
U			0.005					

Analyte	Maximum PB* (mg/Kg)	Maximum ICB/CCB* (ug/L)	Action Limit	Sample Concentration units, unless otherwise noted: mg/Kg											
				1	2	3	4	5	6	7	8	9	12	13	14
Sb	0.8			1.1/2.2	1.6/2.1	1.1/2.1	1.2/2.2		1.4/2.1	1.6/2.1	1.1/2.1	1.5/2.1	1.3/2.1	1.3/2.4	
B		2.0		7.9/10.9	6.9/10.4	8.0/10.4							9.3/10.6		
Cr	0.07														
Sn	3.6			4.3/10.9	4.4/10.4	4.4/10.4	4.7/10.9	6.3/10.1	4.3/10.3	4.5/10.7	4.2/10.3	4.3/11.6	4.3/10.3	4.5/10.6	4.9/11.9

Analyte	Maximum PB* (mg/Kg)	Maximum ICB/CCB* (ug/L)	Action Limit	Sample Concentration units, unless otherwise noted: mg/Kg										
				15	16	17	18	19	20	21	22			
Sb	0.8			1.0/2.5	1.9/2.1		1.4/2.1	1.6/2.2	1.0/2.0	1.8/2.1	1.4/2.2			
B		2.0		8.0/10.7	8.4/10.8				7.4/10.6	9.3/10.8				
Cr	0.07													
Sn	3.6			4.9/12.6	4.1/10.7	4.7/10.8	4.2/10.7	4.7/11.0	4.2/10.2	4.6/10.6	4.4/10.8			

Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	Sample Concentration units, unless otherwise noted: mg/Kg										
					No Qualifiers										
Ba			0.80												
Ti			0.03												

Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	Sample Concentration units, unless otherwise noted: mg/Kg										
					No Qualifiers										
Ba			0.60												

Reason Code: bl

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
 Soil preparation factor applied: 200x x 5xdlil
 Associated Samples: 2-9, 12-22

LDC #: 21991N4
 SDG #: See Cover
 METHOD: Trace metals (EPA SW 846 Method 6010B/6020/7000)
 Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	No Qualifiers
Mn			0.10		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 1

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	No Qualifiers
Na			30.0		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 16-22

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	No Qualifiers
W			0.067		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 1-9, 12-15

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	No Qualifiers
W			0.057		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 19

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	No Qualifiers
Be			0.009		

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

LDC #: 21991N4

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: 1 of 1
Reviewer: CR
2nd Reviewer: LR

METHOD: Trace Metals (EPA SW846 6010B/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: 9/25/09 Soil factor applied: 200X

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

Reason Code: be

Associated Samples: 21, 22

Analyte	Blank ID	Sample Identification									
		10	Action Level	21	22						
Al	4.7										
Pb											
B											
Ca	197		394	7.4+10.6	9.9+10.6						
Cr											
Fe	8.8										
Pb											
Mg	11.2										
Mn	2.4										
K	192										
Na	112										
Sr	0.6										
W	0.78		1.56	0.14 J+	0.27 J+						
Ti	0.4										
Zn	6.4										

LDC #: 21991N4
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Field Blanks

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

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

N/A Were field blanks identified in this SDG?
 N/A Were target analytes detected in the field blanks?

Reason Code: be

Blank units: ug/L Associated sample units: mg/Kg

Sampling date: 9/25/09 Soil factor applied: 200x

Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: 12-20

Analyte	Blank ID	Sample Identification																
		11	12	13	14	15	16	17	18	19	20							
Al	8.5																	
Ba																		
B	2.1			9.3 / 10.6					8.0 / 10.7			8.4 / 10.8						
Ca	298																	
Cr	0.6																	
Fe	29.2																	
Pb	0.036																	
Mg	30.6																	
Mn	4.7																	
Hg	0.03		0.012 / 0.018	0.012 / 0.018	0.018 / 0.020	0.004 / 0.018												
K	64																	
Na	83.6																	
Sr	1.4																	
Ti	0.5																	
W	0.02																	
Zn	2.1																	

LDC #: 21991N4
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

METHOD: Trace Metals (EPA SW846 6010B/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: 8/3/09 Soil factor applied: 100x
 Field blank type: (circle one) Field Blank / Rinsate / Other: Reason Code: bf
 Associated Samples: 1-9, 12-20

Analyte	Blank ID	Action Level	No Qualifiers	Sample Identification			
	FB080309-SO (SDG# R0904279)						
Al	18.6						
Ba	0.8						
Ca	113	113					
Fe	136	136					
Pb	0.042	0.042					
Mg	33.6	33.6					
Mn	7.5	7.5					
Na	66.0						
Sr	1.0						
Ti	1.5						
W	0.04						
Zn	0.8						

LDC 21991N4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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)
	6	7				
Aluminum	7260	9690	29			
Antimony	1.4	1.6		0.2	(<=2.1)	
Arsenic	3.81	3.77	1			
Barium	150	209	33			
Beryllium	0.512	0.462	10			
Boron	40.7	54.7		14	(<=10.7)	
Cadmium	0.12	0.19		0.07	(<=0.11)	
Calcium	26700	18800	35			
Chromium	7.68	7.62	1			
Cobalt	6.4	7.5		1.1	(<=2.1)	
Copper	15.9	18.8	17			
Iron	12400	15900	25			
Lead	8.0	9.1		1.1	(<=2.1)	
Magnesium	9200	9550	4			
Manganese	320	349	9			
Mercury	0.008	0.010		0.002	(<=0.016)	
Molybdenum	0.35	0.43		0.08	(<=0.32)	
Nickel	14.1	16.2	14			
Platinum	0.010	0.010		0	(<=0.11)	

LDC#: 21991N4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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)
	6	7				
Potassium	2000	2590	26			
Sodium	623	794	24			
Strontium	178	223	22			
Thallium	0.091	0.091		0	(≤0.021)	
Tin	4.3	4.5		0.2	(≤10.7)	
Titanium	543	764	34			
Tungsten	0.18	0.14		0.04	(≤0.11)	
Uranium	1.08	1.01	7			
Vanadium	33.1	46.0	33			
Zinc	29.6	33.7	13			

LDC#: 21991N4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 3 of 9
 Reviewer: [Signature]
 2nd Reviewer: _____

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

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 (Parent Only)
	<u>17/16</u>	<u>18/17</u>	RPD	Difference	Limits	
Aluminum	8960	9010	1			
Antimony	1.9	2.2		0.3	(2.2≤)	
Arsenic	2.82	2.35	18			
Barium	172	188	9			
Beryllium	0.490	0.412	17			
Boron	8.0	8.4		0.4	(≤10.8)	
Cadmium	0.15	0.17		0.02	(≤0.11)	
Calcium	30100	28600	5			
Chromium	9.37	7.40		1.97	(≤2.2)	
Cobalt	7.4	7.0		0.4	(≤2.2)	
Copper	18.0	19.6	9			
Iron	15500	15700	1			
Lead	19.4	12.3	45			
Magnesium	9220	9530	3			
Manganese	355	387	9			
Mercury	0.043	0.041		0.002	(≤0.019)	
Molybdenum	0.90	0.82		0.08	(≤0.32)	
Nickel	15.5	16.2	4			

LDC#: 21991N4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 4 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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)
	<u>17</u> <u>16</u>	<u>18</u> <u>17</u>				
Platinum	0.011	0.009		0.002	(≤0.11)	
Potassium	2420	2340	3			
Sodium	487	481	1			
Strontium	202	195		7	(≤43.2)	
Thallium	0.122	0.089		0.033	(≤0.089)	
Tin	4.1	4.7		0.6	(≤10.8)	
Titanium	733	744	1			
Tungsten	0.23	0.18		0.05	(≤0.11)	
Uranium	0.875	0.766	13			
Vanadium	43.0	44.7	4			
Zinc	37.0	41.3	11			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: August 24, 2009

LDC Report Date: December 21, 2009

Matrix: Soil

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

***Sample Delivery Group (SDG):** K0908207

Sample Identification

SA64-10BSPLP3
SA64-10BSPLP2
SA64-10BSPLP3MS
SA64-10BSPLP3DUP
SA64-10BSPLP2MS
SA64-10BSPLP2DUP

Samples in this SDG underwent SPLP extraction
*Corrected SDG throughout report

Introduction

This data review covers 6 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, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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)	Barium Boron Manganese Strontium Zinc	0.040 mg/L 0.01 mg/L 0.0007 mg/L 0.0008 mg/L 0.007 mg/L	SA64-10BSPLP3
PB (prep blank)	Barium Boron Copper Manganese Strontium Zinc	0.030 mg/L 0.01 mg/L 0.003 mg/L 0.0018 mg/L 0.0008 mg/L 0.007 mg/L	SA64-10BSPLP2

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
SA64-10BSPLP3	Barium Boron	0.066 mg/L 0.05 mg/L	0.066J+ mg/L 0.05J+ mg/L

*Indicates change as the result of report review.
SDG K0908207

Sample	Analyte	Reported Concentration	Modified Final Concentration
SA64-10BSPLP2	Boron Copper Zinc	0.09 mg/L 0.029 mg/L 0.027 mg/L	0.09J+ mg/L 0.029J+ mg/L 0.027J+ mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Duplicate Sample Analysis

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

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

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

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG K0908207	All analytes reported below the PQL.	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

No field duplicates were identified in this SDG.

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG K0908207**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
K0908207	SA64-10BSPLP3 SA64-10BSPLP2	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG K0908207**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
K0908207	SA64-10BSPLP3	Barium Boron	0.066J+ mg/L 0.05J+ mg/L	A	bl
K0908207	SA64-10BSPLP2	Boron Copper Zinc	0.09J+ mg/L 0.029J+ mg/L 0.027J+ mg/L	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG K0908207**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 2199104

VALIDATION COMPLETENESS WORKSHEET

SDG #: K0908207

Stage 2B

Laboratory: Columbia Analytical Services

Date: 11-17-09

Page: 1 of 1

Reviewer: CA

2nd Reviewer: W

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

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: <u>8/24/09</u>
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS
VII.	Duplicate Sample Analysis	A	Dup
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
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	SA64-10BSPLP3	11	GBW	21		31	
2	SA64-10BSPLP2	12		22		32	
3	SA64-10BSPLP3MS	13		23		33	
4	SA64-10BSPLP3DUP	14		24		34	
5	SA64-10BSPLP2MS	15		25		35	
6	SA64-10BSPLP2DUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Analyte	Extraction PB* (mg/L)	Method PB* (mg/L)	Maximum ICB/CCB* (ug/L)	Action Limit	1					
Ba	0.040			0.4	0.066 J+					
B	0.01			0.1	0.05 J+					
Mn	0.0007			0.007						
Sr	0.0008			0.008						
Zn	0.007			0.07						

Sample Concentration units, unless otherwise noted: mg/L Associated Samples: 2

Analyte	Extraction PB* (mg/L)	Method PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Action Limit	2					
Ba	0.030			0.3						
B	0.01			0.1	0.09 J+					
Cu	0.003			0.03	0.029 J+					
Mn	0.0018			0.018						
Sr	0.0008			0.008						
Zn	0.007			0.07	0.027 J+					

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

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation,
Henderson, Nevada

Collection Date: September 10 through September 16, 2009

LDC Report Date: November 18, 2009

Matrix: Soil

Parameters: Metals

Validation Level: Stage 4

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0908748

Sample Identification

SA102-10BSPLP2
SA102-10BSPLP3
SA102-30BSPLP2
SA102-30BSPLP3
SA30-9BSPLP2
SA30-9BSPLP3
SA128-10BSPLP2
SA128-10BSPLP3
SA128-29BSPLP2
SA128-29BSPLP3
SA102-10BSPLP2MS
SA102-10BSPLP2DUP
SA102-10BSPLP3MS
SA102-10BSPLP3DUP
SA102-30BSPLP2MS
SA102-30BSPLP2DUP
SA102-30BSPLP3MS
SA102-30BSPLP3DUP

Samples in this SDG underwent SPLP extraction

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 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. 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)	Barium Boron Calcium Magnesium Sodium Strontium Zinc	0.169 mg/L 0.08 mg/L 0.09 mg/L 0.02 mg/L 0.47 mg/L 0.0041 mg/L 0.026 mg/L	SA102-10BSPLP2 SA102-30BSPLP2 SA30-9BSPLP2 SA128-10BSPLP2 SA128-29BSPLP2
PB (prep blank)	Barium Boron Sodium Strontium Zinc	0.067 mg/L 0.04 mg/L 0.24 mg/L 0.0014 mg/L 0.014 mg/L	SA102-10BSPLP3 SA102-30BSPLP3 SA30-9BSPLP3 SA128-10BSPLP3 SA128-29BSPLP3

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
SA102-10BSPLP2	Barium Boron Zinc	0.528 mg/L 0.34 mg/L 0.051 mg/L	0.528J+ mg/L 0.34J+ mg/L 0.051J+ mg/L
SA102-30BSPLP2	Barium Boron Zinc	0.722 mg/L 0.50 mg/L 0.142 mg/L	0.722J+ mg/L 0.50J+ mg/L 0.142J+ mg/L
SA30-9BSPLP2	Barium Boron Magnesium Zinc	0.436 mg/L 0.11 mg/L 0.13 mg/L 0.017 mg/L	0.436J+ mg/L 0.11J+ mg/L 0.13J+ mg/L 0.017J+ mg/L
SA128-10BSPLP2	Barium Boron Zinc	0.625 mg/L 0.13 mg/L 0.043 mg/L	0.625J+ mg/L 0.13J+ mg/L 0.043J+ mg/L
SA128-29BSPLP2	Barium Boron Zinc	0.317 mg/L 0.12 mg/L 0.014 mg/L	0.317J+ mg/L 0.12J+ mg/L 0.014J+ mg/L
SA102-10BSPLP3	Barium Boron Zinc	0.495 mg/L 0.26 mg/L 0.090 mg/L	0.495J+ mg/L 0.26J+ mg/L 0.090J+ mg/L
SA102-30BSPLP3	Barium Zinc	0.605 mg/L 0.029 mg/L	0.605J+ mg/L 0.029J+ mg/L
SA30-9BSPLP3	Barium Boron Zinc	0.455 mg/L 0.12 mg/L 0.019 mg/L	0.455J+ mg/L 0.12J+ mg/L 0.019J+ mg/L
SA128-10BSPLP3	Barium Boron Zinc	0.594 mg/L 0.10 mg/L 0.023 mg/L	0.594J+ mg/L 0.10J+ mg/L 0.023J+ mg/L
SA128-29BSPLP3	Barium Boron Zinc	0.320 mg/L 0.13 mg/L 0.018 mg/L	0.320J+ mg/L 0.13J+ mg/L 0.018J+ mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Duplicate Sample Analysis

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

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

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

XII. Sample Result Verification and Project Quantitation Limit

All sample result verifications were acceptable.

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG K0908748	All analytes reported below the PQL.	J (all detects)	A

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG K0908748**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
K0908748	SA102-10BSPLP2 SA102-10BSPLP3 SA102-30BSPLP2 SA102-30BSPLP3 SA30-9BSPLP2 SA30-9BSPLP3 SA128-10BSPLP2 SA128-10BSPLP3 SA128-29BSPLP2 SA128-29BSPLP3	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG K0908748**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
K0908748	SA102-10BSPLP2	Barium Boron Zinc	0.528J+ mg/L 0.34J+ mg/L 0.051J+ mg/L	A	bl
K0908748	SA102-30BSPLP2	Barium Boron Zinc	0.722J+ mg/L 0.50J+ mg/L 0.142J+ mg/L	A	bl
K0908748	SA30-9BSPLP2	Barium Boron Magnesium Zinc	0.436J+ mg/L 0.11J+ mg/L 0.13J+ mg/L 0.017J+ mg/L	A	bl
K0908748	SA128-10BSPLP2	Barium Boron Zinc	0.625J+ mg/L 0.13J+ mg/L 0.043J+ mg/L	A	bl
K0908748	SA128-29BSPLP2	Barium Boron Zinc	0.317J+ mg/L 0.12J+ mg/L 0.014J+ mg/L	A	bl
K0908748	SA102-10BSPLP3	Barium Boron Zinc	0.495J+ mg/L 0.26J+ mg/L 0.090J+ mg/L	A	bl
K0908748	SA102-30BSPLP3	Barium Zinc	0.605J+ mg/L 0.029J+ mg/L	A	bl

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
K0908748	SA30-9BSPLP3	Barium Boron Zinc	0.455J+ mg/L 0.12J+ mg/L 0.019J+ mg/L	A	bl
K0908748	SA128-10BSPLP3	Barium Boron Zinc	0.594J+ mg/L 0.10J+ mg/L 0.023J+ mg/L	A	bl
K0908748	SA128-29BSPLP3	Barium Boron Zinc	0.320J+ mg/L 0.13J+ mg/L 0.018J+ mg/L	A	bl

**Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG K0908748**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 21991P4

SDG #: K0908748

Laboratory: Columbia Analytical Services

Stage 4

Date: 11-17-09

Page: 1 of 1

Reviewer: CR

2nd Reviewer: W

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

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: <u>9/10/09 - 9/16/09</u>
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	<u>MS</u>
VII.	Duplicate Sample Analysis	A	<u>DUP</u>
VIII.	Laboratory Control Samples (LCS)	A	<u>LCS</u>
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	<u>Not utilized</u>
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	A	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
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	SA102-10BSPLP2	11	SA102-10BSPLP2MS	21	<u>PBW</u>	31	
2	SA102-10BSPLP3	12	SA102-10BSPLP2DUP	22		32	
3	SA102-30BSPLP2	13	SA102-10BSPLP3MS	23		33	
4	SA102-30BSPLP3	14	SA102-10BSPLP3DUP	24		34	
5	SA30-9BSPLP2	15	SA102-30BSPLP2MS	25		35	
6	SA30-9BSPLP3	16	SA102-30BSPLP2DUP	26		36	
7	SA128-10BSPLP2	17	SA102-30BSPLP3MS	27		37	
8	SA128-10BSPLP3	18	SA102-30BSPLP3DUP	28		38	
9	SA128-29BSPLP2	19		29		39	
10	SA128-29BSPLP3	20		30		40	

Notes: _____

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were %RSD of isotopes in the tuning solution < 5%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all instruments calibrated daily, each set-up time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the proper number of standards used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all initial calibration correlation coefficients > 0.995?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. ICP Interference/Check Samples				
Were ICP interference check samples performed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spike/Matrix spike duplicate				
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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 80-120% QC limits for water samples and laboratory established QC limits for soils?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: LM4115
 SDG #: secover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: CR
 2nd Reviewer: V

Validation Area	Yes	No	NA	Findings/Comments
VI. Surface Atomic Absorption (SAA)				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analyses 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?			✓	
VII. ICP Serial Dilutions				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
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.			✓	

Analyte	Extraction PB ^a (mg/L)	Method PB ^a (mg/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	1	3	5	7	9
Ba	0.169			1.69	0.528 J+	0.722 J+	0.436 J+	0.625 J+	0.317 J+
B	0.08			0.8	0.34 J+	0.50 J+	0.11 J+	0.13 J+	0.12 J+
Ca	0.09			0.9					
Mg	0.02			0.2			0.13 J+		
Na	0.47			4.7					
Sr	0.0041			0.041					
Zn	0.026			0.26	0.051 J+	0.142 J+	0.017 J+	0.043 J+	0.014 J+

Sample Concentration units, unless otherwise noted: mg/L Associated Samples: 2, 4, 6, 8, 10

Analyte	Extraction PB ^a (mg/L)	Method PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	2	4	6	8	10
Ba	0.067			0.67	0.495 J+	0.605 J+	0.455 J+	0.594 J+	0.320 J+
B	0.04			0.4	0.26 J+		0.12 J+	0.10 J+	0.13 J+
Na	0.24			2.4					
Sr	0.0014			0.014					
Zn	0.014			0.14	0.090 J+	0.029 J+	0.019 J+	0.023 J+	0.018 J+

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

LDC #: 21991P4
 SDG #: Seaver

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

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:

$\%R = \frac{\text{Found} \times 100}{\text{True}}$ 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		Reported		Acceptable (Y/N)
					%R	%R	%R	%R	
ICV	ICP (Initial calibration)	Ba	5.2	5.0	104		104		Y
	GFAA (Initial calibration)								
ICV	CVAA (Initial calibration)	Hg	0.0051	0.0050	102		102		Y
CCV4	ICP (Continuing calibration)	Fe	10.6	10.0	106		106		J
	GFAA (Continuing calibration)								
CCV2	CVAA (Continuing calibration)	Hg	0.0050	0.0050	100		100		Y
ICV	ICP/MS (Initial calibration)	Pt	0.0240	0.0250	96		96		J
CCV2	ICP/MS (Continuing calibration)	U	0.025	0.025	100		100		J

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 #: 2199RP4
 SDG #: See cover

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

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

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		Reported		Acceptable (Y/N)
					%R / RPD / %D	%R / RPD / %D			
ISSAB	ICP interference check	Ni	0.9279	1.000	93	93			Y
LCS	Laboratory control sample	Sr	10.23	10.00	102	102			Y
11	Matrix spike	Sn	(SSR-SR) 10.670	10.00	107	107			Y
12	Duplicate	Ba	0.528	0.517	2.1	2.1			Y
1	ICP serial dilution	Na	275.10	284.55	3.4	3.4			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 #: 21991P4
 SDG #: seader

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
 Reviewer: CR
 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 B 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

Raw Data: 0.2623 mg/L

Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
2	As	0.01	0.01	Y
	Ba	0.495	0.495	
	B	0.26	0.26	
	Ca	2.15	2.16	
	Cr	2.010	2.011	
	Fe	0.01	0.01	
	Mg	4.25	4.25	
	K	2.0	2.0	
	Na	244	244	
	Sr	0.0567	0.0567	
	W	0.0204	0.0204	
	V	0.036	0.037	
	Zn	0.090	0.091	