

#### LABORATORY DATA CONSULTANTS, INC.

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Northgate Environmental Management, Inc.

December 1, 2009

1100 Quail Street Ste. 102 Newport Beach, CA 92660 ATTN: Ms. Cindy Arnold

SUBJECT: Tronox LLC Facility, 2009 Phase B Investigation, Henderson,

Nevada, Data Validation

Dear Ms. Arnold,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on November 5, 2009. Attachment 1 is a summary of the samples that were reviewed for each analysis.

#### **LDC Project # 21937:**

## <u>SDG #</u> 8304631, 8304632 8304633, 8304634 8304635, 8304636 8304637 <u>Fraction</u> Arsenic & Selenium, Organophosphorus Pesticides 8304637

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Standard Operating Procedures (SOP) 40, Data Review/Validation, BRC 2009
- Quality Assurance Project Plan Tronox LLC Facility, Henderson Nevada, June 2009
- NDEP Guidance, May 2006
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

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

Sincerely,

Erlinda T. Rauto

Operations Manager/Senior Chemist

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Page: 1 of 1 Reviewer: JE

2nd Reviewer: BC

LDC #: <u>21937</u> SDG #: <u>8304631, 8304632, 8304633, 8304634</u>

<u>8304635, 8304636, 8304637</u>

#### Tronox Northgate Henderson Worksheet

EDD Area	Yes	No	NA	Findings/Comments
I. Completeness  Is there an EDD for the associated Tronox validation report?	X			
II. EDD Qualifier Population  Were all qualifiers from the validation report populated into the EDD?	X			
III. EDD Lab Anomalies	1 <u>-</u>		I I	
Were EDD anomalies identified?	X			
If yes, were they corrected or documented for the client?	X			See EDD_discrepancy_ form_LDC21937_113009.doc
IV. EDD Delivery			ī	
Was the final EDD sent to the client?	X			

## Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Data Validation Reports LDC #21937

Arsenic & Selenium



## 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 21, 2009

Matrix:

Water

Parameters:

Arsenic & Selenium

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304632

#### Sample Identification

M-89B

FILTB092509-A2

M-2AB

M-2009AB

M-89BMS

M-89BMSD

#### 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 Method 6020 for Arsenic and Selenium.

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.
- UJ 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	Selenium	4.101 ug/L	All samples in SDG 8304632

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 (5X)	Selenium	7.9 ug/L	25U ug/L
FILTB092509-A2	Selenium	2.0 ug/L	5.0U 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
FILTB092509-A2	9/25/09	Selenium	2.0 ug/L	M-2AB M-2009AB

Sample concentrations were compared to concentrations detected in the filter blank 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) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
M-89BMS/MSD (All samples in SDG 8304632)	Selenium	-	132 (75-125)	-	J+ (all detects)	A

#### VII. Duplicate Sample Analysis

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

#### 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 8304632	All analytes reported below the PQL.	J (all detects)	Α

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:

	Concentra	tion (ug/L)	, non	Difference		
Compound	M-2AB	M-2009AB	RPD (Limits)	Difference (Limits)	Flags	A or P
Arsenic	80	80	_	0 (≤25)	-	•
Selenium	25	19	-	6 (≤25)	-	-

## Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Data Qualification Summary - SDG 8304632

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
8304632	M-89B FILTB092509-A2 M-2AB M-2009AB	Selenium	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R) (m)
8304632	M-89B FILTB092509-A2 M-2AB M-2009AB	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

#### Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Laboratory Blank Data Qualification Summary - SDG 8304632

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
8304632	M-89B (5X)	Selenium	25U ug/L	Α	bl
8304632	FILTB092509-A2	Selenium	5.0U ug/L	А	bl

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Filter Blank Data Qualification Summary - SDG 8304632

No Sample Data Qualified in this SDG

#### **Tronox Northgate Henderson VALIDATION COMPLETENESS WORKSHEET** Stage 2B

21937B4 LDC #: SDG #: 8304632 Laboratory: Test America

Page: Cof \ Reviewer: ( ) 2nd Reviewer:

METHOD: As & Se (EPA SW 846 Method 6020)

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(24/00-9/75/00
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	Su	ms/D
VII.	Duplicate Sample Analysis	$\sim$	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	$N_{\perp}$	Notriewed Notutilized
X.	Furnace Atomic Absorption QC	$\mathcal{N}_{-}$	Notutilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(C3,4)
XV	Field Blanks	SW	FilterBlank=Z

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

	<u> </u>					
1	M-89B	11	PBW	21	 31	
2	FILTB092509-A2	12		22	32	
3	M-2AB	13		23	33	
4	M-2009AB	14		24	34	
5	M-89BMS	15		25	35	
6	M-89BMSD	16		26	36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

Notes:			

LDC #: 7193787 SDG #: Selcol

#### VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: of Pag

All circled elements are applicable to each sample.

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Sample ID	Matrix	Target Analyte List (TAL)
1-4	water	Al, Sb.(As)Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, KSe, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
QCS.6	$\mathcal{U}$	Al, Sb.(As) Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN'
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al. Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al. Sb. As. Ba. Be. Cd. Ca. Cr. Co. Cu. Fe. Pb. Mg. Mn. Hg. Ni. K. Se. Ag. Na. Ti. V. Zn. Mo. B. Si. CN
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		Al. Sb. As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
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		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Π, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN <sup>-</sup> ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN',
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN <sup>-</sup> ,
ICP-MS		Al, Sb, (As) Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K(Se) Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
GFAA		
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,

Comments:	Mercury by CVAA if performed	

2nd Reviewer:

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

LDC #: <u>21937B4</u> SDG #: See Cover	VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES	Reason: 51
METHOD: Trace metals (EPA SW 846 Method 6010B/6020/7000)	Soil preparation factor applied: NA	
Sample Concentration units, unless otherwise noted: ug/L	Associated Samples: All	

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	9)	7.9
	Action Limit	
	Maximum ICB/CCB <sup>a</sup> (ug/L)	4.101
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	Maximun PB <sup>a</sup> (ug/L)	
	L mun	
	Analyte Maximum Maximum PB <sup>a</sup> ICB/CCB <sup>a</sup> (mg/Kg) (ug/L) (ug/L)	
	yte	
	Anal	Se

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

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LDC #: 21937B4

SDG #: See Cover

**VALIDATION FINDINGS WORKSHEET** 

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Reviewer: 2nd Reviewer:\_\_

Field Blanks

**МЕТНОD**: Trace Metals (EPA SW846 6010В/7000)

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

Blank units: ug/L Associated sample units: ug/L Sampling date: 9/25/09 Soil factor applied NA Field blank type: (circle one) Field Blank / Rinsate / Other:

Filter Blank

Reason Code: br

3, 4

Associated Samples:

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Blank ID	2	2.0														
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100 #: 21971671 800 #: SERCOLOR

# VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Reviewer: 2nd Reviewer:

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

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

N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N/A

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

of 4 or more, no action was taken.

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

LEVEL IN ONLY:

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

	)							
*	OI OSW/SW	Matrix		MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
		water	36		261		θ11	Jacot (4 (m)
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LDC 21937B4 SDG#: See Cover

#### **VALIDATION FINDINGS WORKSHEET** Field Duplicates

2nd Reviewer:

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

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

	Concentrat	ion (ug/L)	(≤30)			Qualifications
Compound	3	4	RPD	Difference	Limits	(Parent Only)
Arsenic	80	80		0	(≤25)	
Selenium	25	19		6	(≤25)	

V:\FIELD DUPLICATES\FD\_inorganic\21937B4.wpd

## Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

October 2, 2009

LDC Report Date:

November 21, 2009

Matrix:

Water

Parameters:

Arsenic & Selenium

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304634

Sample Identification

PB100209

M-76B

M-76009B

PB100209MS

PB100209MSD

#### Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Arsenic and Selenium.

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.
- UJ 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.

Sample FILTB092509-A2 (from SDG 8304632) 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
FILTB092509-A2	9/25/09	Selenium	2.0 ug/L	All samples in SDG 8304634

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
M-76B	Selenium	4.5 ug/L	5.0U ug/L
M-76009B	Selenium	3.9 ug/L	5.0U ug/L

Sample PB100209 was identified as a pump blank. No metal contaminants were found in this blank.

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

#### VII. Duplicate Sample Analysis

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

#### 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 8304634	All analytes reported below the PQL.	J (all detects)	Α

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-76B and M-76009B were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

	Concentration (ug/L)				nnn.	D:#		
Compound	M-76B	M-76009B	RPD (Limits)	Difference (Limits)	Flags	A or P		
Arsenic	110	110	0 (≤30)	-	-	-		
Selenium	4.5	3.9	•	0.6 (≤5)	-	-		

### Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Data Qualification Summary - SDG 8304634

SDG	Sample	Sample Analyte		A or P	Reason (Code)
8304634	PB100209 M-76B M-76009B	All analytes reported below the PQL.	J (all detects)	А	Sample result verification (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Laboratory Blank Data Qualification Summary - SDG 8304634

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Filter Blank Data Qualification Summary - SDG 8304634

SDG	Sample	Analyte	Modified Final Analyte Concentration			
8304634	M-76B	Selenium	5.0U ug/L	Α	br	
8304634	M-76009B	Selenium	5.0U ug/L	А	br	

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Arsenic & Selenium - Pump Blank Data Qualification Summary - SDG 8304634

No Sample Data Qualified in this SDG

#### **Tronox Northgate Henderson ESS WORKSHEET**

_DC #:	21937D4	VALIDATION COMPLETENE
SDG #:	8304634	Stage 2B
aborator	v: Test America	

Date: 11-160
Page: <u> </u> of <u> </u>
Reviewer: _ C
2nd Reviewer:

METHOD: As & Se (EPA SW 846 Method 6020)

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: 1017/00
II.	ICP/MS Tune	A	
111.	Calibration	A	
ŧV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MSD
VII.	Duplicate Sample Analysis	$\sim$	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Notreviewed Notuti Itzed
Χ.	Furnace Atomic Absorption QC	$\mathcal{N}$	Notutilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(2,3)
ΧV	Field Blanks	SW	FITELBLANK = FILTBU925051 -AZ (S06#830-6  PUMPBIANK = I  B detected  D = Duplicate  D = Trip blook

N = Not provided/applicable

SW = See worksheet

R = Rinsate

FB = Field blank

TB = Trip blank
EB = Equipment blank

Validated Samples:

	<u> </u>					
1	PB100209	11	PBW	21	31	
2	M-76B	12		22	32	
3	M-76009B	13		23	33	
4	PB100209MS	14		24	34	
5	PB100209MSD	15		25	35	
6		16		26	 36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

Notes:	

LDC #: 2193701 SDG #: SELCOLO?

#### VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-3	water	Al, Sb(As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K(Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
QC:45		Al, Sb. (As.)Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K (Se) Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
	0	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Ai, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN'
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN',
		Al. Sb. As. Ba. Be. Cd. Ca. Cr. Co. Cu. Fe. Pb. Mg. Mn. Hg. Ni. K. Se. Ag. Na, Tl. V, Zn, Mo, B, Si, CN <sup>-</sup> ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Sa, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al. Sb. As. Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN <sup>-</sup> ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN <sup>-</sup> ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Π, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP Trace		Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP-MS	W	Al, Sb(As)Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zh, Mo, B, Si, CN,

Comments: Mercury by CVAA if performed

LDC #: 21937D4

SDG #: See Cover

**VALIDATION FINDINGS WORKSHEET** Field Blanks

Reviewer:\_ Page:\_

2nd Reviewer:

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

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

Were field blanks identified in this SDG?

Blank units: ug/L Associated sample units: ug/L Sampling date: 9/25/09 Soil factor applied NA

Filter Blank Sampling date: 9/25/09 Soil factor applied NA Field blank / Rinsate / Other.

Reason Code: br

₹

Associated Samples:

			 	 <del></del>	 	 	<del>- T</del>	<del>- 1</del>	 	1	T	<del>- 1</del>	<u> </u>	 _	_
tion															
Sample Identification															
Samp															
\															
	3	3.9 / 5.0													
	2	4.5 / 5.0													
	Action Level														
Blank ID	FILTB092509-A2 (SDG#: 8304632)	2.0													
Analyte	-84000000000000000000000000000000000000	»													

LDC <u>21937D4</u> SDG#: <u>See Cover</u>

#### VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:of	1
Reviewer:	<u>ca</u> ,
2nd Reviewer:	<u>~</u>

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

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

Compound	Concentrat	ion (ug/L)	(≤30) RPD	Difference	Limits	Qualifications (Parent Only)
Arsenic	110	110	0			
Selenium	4.5	3.9		0.6	(≤5)	

V:\FIELD DUPLICATES\FD\_inorganic\21937D4.wpd

## Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Data Validation Reports LDC #21937

Organophosphorus Pesticides

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** 

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

September 23, 2009

LDC Report Date:

November 21, 2009

Matrix:

Soil

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304631

#### Sample Identification

SA148-10BSPLP

SA148-35BSPLP

SA148-10BSPLPMS

SA148-10BSPLPMSD

SA148-10BSPLPDI

SA148-35BSPLPDI

SA148-35BSPLPDIMS

SA148-35BSPLPDIMSD

#### Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

#### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination  $(r^2)$  was greater than or equal to 0.990.

#### b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304631	J- (all detects) UJ (all non-detects)	A
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304631	J- (all detects) UJ (all non-detects)	Α

#### III. Blanks

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

No field blanks were identified in this SDG.

#### IV. Accuracy and Precision Data

#### a. Surrogate Recovery

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

#### b. Matrix Spike/Matrix Spike Duplicates

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

#### c. Laboratory Control Samples

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

#### V. Target Compound Identification

Raw data were not reviewed for this SDG.

#### VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304631	All compounds reported below the PQL.	J (all detects)	Α

Raw data were not reviewed for this SDG.

#### VII. System Performance

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

#### Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304631

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304631	SA148-10BSPLP SA148-35BSPLP SA148-10BSPLPDI SA148-35BSPLPDI	Mevinphos	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D) (c)
8304631	SA148-10BSPLP SA148-35BSPLP SA148-10BSPLPDI SA148-35BSPLPDI	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304631

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304631

No Sample Data Qualified in this SDG

## thanta Uandaraan

	i ronox Nortngate Henderson	
LDC #: 21937A17	VALIDATION COMPLETENESS WORKSHEET	Date: 11/17/09
SDG #: 8304631	Stage 2B	Page: <u> </u>
Laboratory: Test America	-	Reviewer: <u>3/6</u>
		2nd Reviewer:
METHOD: GC Organophosp	horus Pesticides (EPA SW 846 Method 8141A)	

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: 9/23/69
IIa.	Initial calibration	A	2 RSD = 20 3 rx ca/10 = 20 3
IIb.	Calibration verification/ICV	SW	ca/a = 20 2
111.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	l li	

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:

	501				
1	SA148-10BSPLP	11 1 927 3443 - BI	k 21	31	
2 1	SA148-35BSPLP	12 7 9273461 - BI	lc 22	32	
3	SA148-10BSPLPMS	13	23	33	
4 1	SA148-10BSPLPMSD	14	24	34	
5 <b>&gt;</b>	SA 148- 10 B SPLP DI	15	25	35	
6	SA 148-35BSPLP DI	16	26	36	
7 Y	SA 148 - 35 B SPLP DI MS	17	27	37	
8	MSD	18	28	38	
9		19	29	39	
10		20	30	40	

Notes:		

# VALIDATION FINDINGS WORKSHEET

METHOD: /GC HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V Rentene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mavimhos	tw Deleter	
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	CC. Toluene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	- 1
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG Total Yolene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	l. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate	DD. Triffuralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	o,		O. Chlorpyrifos	J.T Thisserin	
P. Pyrene	<u>.</u>		P. Fenthion	1	
Ö	ප		Q. Parathion-ethyl	۱۹	
R.			R. Trichloronate	1 .	אינטרט יווים אורכ
8,			S. Merphos		77
			T. Stirofos		" " " " " " " " " " " " " " " " " " "
	·		U. Tokuthion		

cmpd\_list.wpd

7 47	Z Š
2193	766
LDC #:_	SDG #:

## VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: 1 of 1 Reviewer: 3/6 2nd Reviewer:

METHOD: GC HPLC

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

What type of continuing calibration calculation was performed? <a href="#">/ N/A</a> Were continuing calibration standards analyzed at the required frequencies?

Did the continuing calibration standards meet the %D / %R validation criteria of <20.0% / 80-120%?

YNANA Did the continuing calibration standards meet the %D / Level IV Only

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

Qualifications	5-/NJ/A (C)																							
Associated Samples	All + BIKS																							
RT (limit)	( )	(	(	( )	( )	( )	( )	( )	( )	)	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
%D (Limit ≤ 20.0)	30.8	21.7																						
pur	$\odot$	(c) <b>g</b> ,	•																					
Detector/	* - F3	Co.J. 2																						
11 II	010 F1001		•																		-			
# Date	4/20/10	, ,																						

LDC #: 21 927 4 17 Le Gar SDG #:

### VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

2nd Reviewer:

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

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed? Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

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

(MS/MSDin) ( MSH : ) Qualifications No ruel Associated Samples 30 . 28 RPD (Limits) 32 3 MSD %R (Limits) (511-09) MS %R (Limits) 27 Compound Z MS/MSD ID

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

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

September 24, 2009

**LDC Report Date:** 

November 21, 2009

Matrix:

Water

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304632

Sample Identification

M-89B

M-89BMS

M-89BMSD

#### Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

#### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination  $(r^2)$  was greater than or equal to 0.990.

#### b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304632	J- (all detects) UJ (all non-detects)	A
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304632	J- (all detects) UJ (all non-detects)	Α

#### III. Blanks

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

Sample FB080409-GW (from SDG 8304622) was identified as a field blank. No organophosphorus pesticide contaminants were found in this blank.

#### IV. Accuracy and Precision Data

#### a. Surrogate Recovery

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

#### b. Matrix Spike/Matrix Spike Duplicates

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

#### c. Laboratory Control Samples

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

#### V. Target Compound Identification

Raw data were not reviewed for this SDG.

#### VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304632	All compounds reported below the PQL.	J (all detects)	Α

Raw data were not reviewed for this SDG.

#### VII. System Performance

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

#### Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304632

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304632	M-89B	Mevinphos	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D) (c)
8304632	M-89B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304632

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304632

No Sample Data Qualified in this SDG

#### Tronox Northgate Henderson SHEET

LDC #: <u>21937B17</u>	_ VALIDATION COMPLETENESS WORK
SDG #: 8304632	_ Stage 2B
Laboratory: <u>Test America</u>	
METHOD: GC Organophoen	horus Pesticides (EPA SW 846 Method 8141A)

Date:_	11/17/09
Page:_	<u>lof</u>
Reviewer:	5/6
2nd Reviewer:	
	/

**METHOD:** GC Organophosphorus Pesticides (EPA SW 846 Method 8141A)

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
ı,	Technical holding times	Á	Sampling dates: 9/24/69
IIa.	Initial calibration	A	2 RSD = 20 2 r7 CON /100 = 20 3
Ilb.	Calibration verification/ICV	SW	CONTON E 203
111.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	us
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N)	_
X.	Field blanks	ND	FB = FB080409-GW (from 8304622)

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

	010	161			
1	M-89B	11	9273433.Blk	21	31
2	M-89BMS	12		22	32
3	M-89BMSD	13		23	33
4		14		24	34
5		15		25	35
6		16		26	36
7		17		27	37
8		18		28	38
9		19		29	39
10		20		30	40

Notes:		

# VALIDATION FINDINGS WORKSHEET

METHOD: / GC HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azlnphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,l)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
1. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	·o		O. Chlorpyrifos	JJ. Thionazin	
P. Pyrene	a.	,	P. Fenthion	i .	
Ö	G		Q. Parathion-ethyl	١	os phoro thio ate
R.			R. Trichloronate	MM. Famphur	
S.			S. Merphos	NN. Carbophenothion	00
			T. Stirofos		on - methy/
			U. Tokuthion		

21937 817 SDG #: LDC#:

## VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: lof / Reviewer:\_ 2nd Reviewer:\_

METHOD: GC HPLC

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

Were continuing calibration standards analyzed at the required frequencies? What type of continuing calibration calculation was performed? \_\_%D or \_\_%R X N N/A

Did the continuing calibration standards meet the %D / %R validation criteria of <20.0% / 80-120%?

evel IV Only

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

Qualifications	J-/MJ/A (C,)	1																			
Associated Samples	All + Blk	3				- Address - Addr															
RT (limit)	( )	( )	(	( )	( )	( )	( )	( )	(	(	( )		( )	( )	(	( )	( )	(	(	(	( )
%D (Limit ≤ 20.0)	30.8	21.7	•																		
Compound	(-) 8	(-) B	•																		
Detector/	2.7	なごと																			
Standard ID	010 F1001	( M)																			
Date	29 69																				
#																					

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

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

September 28 through October 2, 2009

LDC Report Date:

November 21, 2009

Matrix:

Soil

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304633

#### Sample Identification

SA209-0.5B

SA209-10B

SA209009-10B

SA209-35B

RSAR3-0.5B

RSAR3-35B

SA211-0.5B

SA211-11B

SA211-43B

RSAR3-0.5BMS

RSAR3-0.5BMSD

SA211-0.5BMS

SA211-0.5BMSD

#### Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

#### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r²) was greater than or equal to 0.990.

#### b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0% with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/13/09	028F2801	1	Naled	38.1	RSAR3-0.5B RSAR3-35B RSAR3-0.5BMS RSAR3-0.5BMSD 9278427-BLK	J- (all detects) UJ (all non-detects)	A
10/13/09	028F2801	2	Naled	38.4	RSAR3-0.5B RSAR3-35B RSAR3-0.5BMS RSAR3-0.5BMSD 9278427-BLK	J- (all detects) UJ (all non-detects)	А
10/13/09	035F3501	1	Naied	35.6	SA211-0.5B SA211-11B SA211-43B SA211-0.5BMS SA211-0.5BMSD 9281219-BLK	J- (all detects) UJ (all non-detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/13/09	035F3501	2	Naled	41.3	SA211-0.5B SA211-11B SA211-43B SA211-0.5BMS SA211-0.5BMSD 9281219-BLK	J- (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304633	J- (all detects) UJ (all non-detects)	A
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304633	J- (all detects) UJ (all non-detects)	А

#### III. Blanks

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

Sample FB080309-SO (from SDG 83041623) was identified as a field blank. No organophosphorus pesticide contaminants were found in this blank.

#### IV. Accuracy and Precision Data

#### a. Surrogate Recovery

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

#### b. Matrix Spike/Matrix Spike Duplicates

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

#### c. Laboratory Control Samples

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

#### V. Target Compound Identification

Raw data were not reviewed for this SDG.

#### VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304633	All compounds reported below the PQL.	J (all detects)	Α

Raw data were not reviewed for this SDG.

#### VII. System Performance

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

Samples SA209-10B and SA209009-10B were identified as field duplicates. No organophosphorus pesticides were detected in any of the samples.

#### Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304633

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304633	RSAR3-0.5B RSAR3-35B SA211-0.5B SA211-11B SA211-43B	Naled	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (c)
8304633	SA209-0.5B SA209-10B SA209009-10B SA209-35B RSAR3-0.5B RSAR3-35B SA211-0.5B SA211-11B SA211-43B	Mevinphos	J- (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D) (c)
8304633	SA209-0.5B SA209-10B SA209009-10B SA209-35B RSAR3-0.5B RSAR3-35B SA211-0.5B SA211-11B SA211-43B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304633

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304633

No Sample Data Qualified in this SDG

	:21937C17	VAL		I COMP	LETENE	enderson SS WORK	SHEET		Date: 11/17/69
SDG #				S	tage 2B				Page: 1 of 1 Reviewer: 3vc
_abor	atory: <u>Test America</u>							2nd	Reviewer:
METH	IOD: GC Organophospho	orus P	esticides (E	PA SW 84	46 Method	8141A)			
	amples listed below were tion findings worksheets.	reviev	wed for eac	h of the fo	ollowing val	dation areas.	Validation	findings are	noted in attached
	Validation	Area					Comme	nts	
I.	Technical holding times			A	Sampling dat	es: 9/28.	- 10/02/0	9	
lla.	Initial calibration			A	% R	SD = 20 %	r2	-tunur	
llb.	Calibration verification/ICV			SW	cal	1W = 20 3	ઢ		
III.	Blanks			A					
IVa.	Surrogate recovery			<u> </u>					
IVb.	Matrix spike/Matrix spike dupl	licates		SW					
IVc.	Laboratory control samples			<u> </u>	Las	<u> </u>			
V.	Target compound identification	on		N		***************************************			
VI.	Compound Quantitation and 0	CRQLs		<u>N</u>					
VII.	System Performance			N					
VIII.	Overall assessment of data			A					
IX.	Field duplicates			ND	$\frac{\nu}{\nu}$	= 2,3	9 0206 CA	Cfeen	8304623)
X.	Field blanks			ND		LD = LDO	8 0 2001- 20	( ),,,,	8 30 1645)
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		ND = No R = Rins FB = Fie	sate	detected D =	TB = Trip	blank ipment blank		
	ed Samples:	·							
1 1	SA209-0.5B	11 7	RSAR3-0.5BN	/ISD	21 1	9274	4556-BIK 3	31	
2 1	SA209-10B	12 <b>3</b>	SA211-0.5BM	S	22	9278427		2	
3 1	SA209009-10B <i>D</i>	13 <b>3</b>	SA211-0.5BM	SD	23 3	9281219-	- BIK 3	3	
4 1	SA209-35B	14			24		3	34	
5 <b>2</b>	RSAR3-0.5B	15			25		3	35	
6	RSAR3-35B	16			26		3	36	
7 3	SA211-0.5B	17			27		3	37	
8 3	SA211-11B	18			28		3	88	
9 3	SA211-43B	19			29		3	39	

**7** RSAR3-0.5BMS

Notes:\_

# VALIDATION FINDINGS WORKSHEET

METHOD: / GC HPLC

8310	8330	8151	8141	8141(con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	C. Tolugas
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)peryiene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	1. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Dlazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachiorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	o.		O. Chlorpyrifos	JJ. Thionazin	
P. Pyrene	a.	-	P. Fenthlon	1	
Ö.	٥		Q. Parathion-ethyl	0	ocebara this ata
ж.			R. Trichloronate	1	
S.			S. Merphos		70
		·	T. Stirofos		ion - methul
	·		U. Tokuthion		

cmpd\_list.wpd

25 25 LDC#: 21937C17 SDG #:

## VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: \ of 2nd Reviewer: Reviewer:

> GC HPLC METHOD:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". What type of continuing calibration calculation was performed? WD or WR

YN N/A

Were continuing calibration standards analyzed at the required frequencies?

N N/A

Did the continuing calibration standards meet the %D / %R validation criteria of <20.0% / 80-120%?

evel IV Only N/N/N

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

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
	19/60/6	010 F1001	(M.)	B (-)	30.8	(	All + Blants	J-MJA (c)
	,	(m)	Cad. 2	B (-)	21.7	(		,
					,	( )	>	
						( )		
	10/5/69	0 28 F 280)	(M)	(~) <del>1</del>	38.)	(	5 6 16,11, 9278427-BIK	
		(Ms)	CA. Y	F (-)	38.4	( )		
						( )	•	
						( )		
	10/13/69	035 F3501	Cz, _	$(\cdot) \neq$	35.6	( )	7-9 12, 13, 9281219-1111	\frac{\psi}{2}
	-	( BS)	2 20	(-) 1	41.3	( )		•
		· · ·				( )	•	
						( )		
						(		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						(		

75 65 LDC #: 21937 C17 SDG#:

# VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 10f Reviewer 2nd Reviewer.

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

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed? Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

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

Y/N N/A

	ر خرج		<u>-</u>	T	T	<del>, -</del>	<del></del>	_	<del></del>	T ==	т-	τ-	11	<del>-</del>	<del>7</del>	<del></del>	<del>-</del>	T	N	T	<del>1 -</del>	T	Т	T	T
Qualifications	MSD JAKE (MSD	MS/MSD			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \																				
Associated Samples	7				->																				
RPD (Limits)	48 40	ì	43 (40 )	19 (40)	37 (3)	_		(	( )	( )	(	(	( )	( )	)	( )	`	(	( )	( )	( )	( )		(	
MSD %R (Limits)	(	)	( ) .	( )	( )	( )	( )	( )	( )	( )	( )	(	( )	( . )	( )	( )	( )		( )	( )	( )	( )	(	( )	(
MS %R (Limits)	40 (45-115)	( )		( )	(	)		( )		( )	( )		( )	( )	( )	( )	( )	(	( )	( )	( )	( )	( )	( )	
Compound	ユ	. X	Ы	¥	MM																				
QI QSW/SW	10/11	\																							
*																									

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

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

September 30, 2009

**LDC Report Date:** 

November 21, 2009

Matrix:

Water

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304634

Sample Identification

TR-4B

TR-2B

#### Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

#### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination  $(r^2)$  was greater than or equal to 0.990.

#### b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0%.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304634	J- (all detects) UJ (all non-detects)	A
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304634	J- (all detects) UJ (all non-detects)	A

#### III. Blanks

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

Sample FB060309 (from SDG 8304603) was identified as a field blank. No organophosphorus pesticide contaminants were found in this blank.

#### IV. Accuracy and Precision Data

#### a. Surrogate Recovery

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

#### b. Matrix Spike/Matrix Spike Duplicates

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

#### c. Laboratory Control Samples

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

#### V. Target Compound Identification

Raw data were not reviewed for this SDG.

#### VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304634	All compounds reported below the PQL.	J (all detects)	Α

Raw data were not reviewed for this SDG.

#### VII. System Performance

Raw data were not reviewed for this SDG.

#### VIII. Overall Assessment of Data

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

#### IX. Field Duplicates

No field duplicates were identified in this SDG.

#### Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304634

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304634	TR-4B TR-2B	Mevinphos	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D) (c)
8304634	TR-4B TR-2B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304634

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304634

No Sample Data Qualified in this SDG

### **Tronox Northgate Henderson**

SDG # _abora	: 21937D17 : 8304634 atory: Test America			S	tage 2B		EET	Date: <u>リイフ /6 9</u> Page: <u>l</u> of <u>l</u> Reviewer: <u>タ</u> 火 2nd Reviewer:
The sa		e reviev					lidation find	ings are noted in attached
	Validation	Area					omments	
1.	Technical holding times			A	Sampling da	tes: 9/20/00		
ila.	Initial calibration			A	<b>U</b> *	RSD = 203	r>	
lib.	Calibration verification/ICV			SN	ca	100 4 20 7	<u> </u>	
111.	Blanks			A				
IVa.	Surrogate recovery			A				
IVb.	Matrix spike/Matrix spike du	plicates		N	Che	il spec		linsufficient vol.
IVc.	Laboratory control samples			A	LC.	2 00 2		
V.	Target compound identifica	tion		N				
VI.	Compound Quantitation and			N				
VII.	System Performance			N				
VIII.	Overall assessment of data			A				
IX.	Field duplicates			N				
X.	Field blanks			ND	FB =	FB 06 0 3 0 9	(from 8	130 4603)
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:	e	R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip blan EB = Equipme		
M		I I					21	
	TR-4B	11			21		31	
2 - 3	TR-2B	12	1		22		32	
	9274555-BIK	13			23		33	
4		14			24		34	
5		15			25		35	
6		16			26		36	
7		17			27		37	
8		18			28		38	
9		19			29		39 40	
10		20			30		<b>1</b> 40	
Notes	:	<u> </u>						

# VALIDATION FINDINGS WORKSHEET

METHOD: / GC HPLC

8310	8330	8151	(8141	8141(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	\ B
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinohos	W Doletee	
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	FF February
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5.TP	D. Demeton-S	Y. Azinohos-methvi	1
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xvlene
G. Benzo(g,h,l)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichiorinate	
1. Chrysene	l. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate		
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	· o		O. Chlorpyrifos	J.T Thionerin	
P. Pyrene	a.		P. Fenthion	1	
Ö.	ø		Q. Parathion-ethyl	0	se phone this sta
<u>ښ</u>			R. Trichloronate	1 .	212211111111111111111111111111111111111
ý			S. Merphos		20
			T. Stirofos		m - m++hu/
			U. Tokuthion		

il bamo

Notes:

LDC # 21937 D17 Sa Comy SDG #:

## **VALIDATION FINDINGS WORKSHEET** Continuing Calibration

Reviewer: 2nd Reviewer:

Page: \of \

METHOD: / GC \_\_ HPLC

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

X N/A

Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?

Y(N N/A Level # Only

Were the retention times for all calibrated compounds within their respective acceptance windows? Y N(NA)

Qualifications	3-/NJA (C)	<b>†</b>																		
Associated Samples	A11 + B1K																			
RT (limit)	( )	( )	(		(	(		(	( )	)	(	(		(	(	(	(	( )	(	
%D (Limit ≤ 20.0)	30.8	7.)c																		
Compound	$\overline{}$	(j.) 8																		
Detector/ &olumn	C.1.1	54,2																		
Standard ID	010 F 1001	(M)																		
# Date	9/29/69	~																		

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

**Project/Site Name:** 

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

October 1, 2009

LDC Report Date:

November 21, 2009

Matrix:

Soil

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304635

#### Sample Identification

RSAR3-0.5BSPLP

RSAR3-35BSPLP

RSAR3-0.5BSPLPMS

RSAR3-0.5BSPLPMSD

RSAR3-0.5BSPLPDI

RSAR3-35BSPLPDI

RSAR3-0.5BSPLPDIMS

RSAR3-0.5BSPLPDIMSD

#### Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

#### The following are definitions of the data qualifiers:

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

#### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r²) was greater than or equal to 0.990.

#### b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0% with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/12/09	015F1501	1	Naled	58.1	All samples in SDG 8304635	J- (all detects) UJ (all non-detects)	А
		Ronnel	20.8		J- (all detects) UJ (all non-detects)		
10/12/09	015F1501	2	Naled	57.3	All samples in SDG 8304635	J- (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304635	J- (all detects) UJ (all non-detects)	А

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304635	J- (all detects) UJ (all non-detects)	A

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Accuracy and Precision Data

# a. Surrogate Recovery

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

# b. Matrix Spike/Matrix Spike Duplicates

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

# c. Laboratory Control Samples

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

# V. Target Compound Identification

Raw data were not reviewed for this SDG.

# VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304635	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

# VII. System Performance

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304635

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304635	RSAR3-0.5BSPLP RSAR3-35BSPLP RSAR3-0.5BSPLPDI RSAR3-35BSPLPDI	Naled Ronnel	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (c)
8304635	RSAR3-0.5BSPLP RSAR3-35BSPLP RSAR3-0.5BSPLPDI RSAR3-35BSPLPDI	Mevinphos	J- (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D) (c)
8304635	RSAR3-0.5BSPLP RSAR3-35BSPLP RSAR3-0.5BSPLPDI RSAR3-35BSPLPDI	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304635

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304635

No Sample Data Qualified in this SDG

SDG#	21937E17 :8304635 tory: <u>Test America</u>	VA	Tror LIDATION			ENE			HEET		Date: \frac{\lambda \sqrt{ 7 \lambda}}{ 7 \lambda}  Page: \frac{\lambda \sqrt{ 7 \lambda}}{   \
METH	OD: GC Organophospho	orus F	Pesticides (E	EPA SW 8	846 Me	ethod	8141	A)			Zila Neviewei
	mples listed below were on findings worksheets.	revie	wed for eac	ch of the f	ollowin	ng vali	idatio	n areas. \	√alidation	find	lings are noted in attached
	Validation	Area							Comme	nts	
I.	Technical holding times			Á	Sampli	ing dat	es: le	101/00	í		
IIa.	Initial calibration			A				202		·	
IIb.	Calibration verification/ICV			SW		cW	NW	€ 20°	<u>z</u>		
111.	Blanks			<u> </u>							
IVa.	Surrogate recovery			A							
IVb.	Matrix spike/Matrix spike dur	licates	3	Â							
IVc.	Laboratory control samples			A	<u> </u>	cs					
V.	Target compound identificati	on		N							
VI.	Compound Quantitation and	CRQL	s	N							
VII.	System Performance			N	_						
VIII.	Overall assessment of data			A		_					
IX.	Field duplicates			N							
X.	Field blanks			N				2			
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:		ND = No R = Rins FB = Fie		ds detect	ted	•	O = Duplica TB = Trip b EB = Equip			
1 \F	RSAR3-0.5BSPLP	11 /	92805	700 - B/t	_ [	21			3	31	
	RSAR3-35BSPLP	12 >		197 - BI		22				32	
	RSAR3-0.5BSPLPMS	13				23				33	
	RSAR3-0.5BSPLPMSD	14				24			3	34	
	RSAR3-0.58 SPIP DI	15				25			3	35	
II — —	RSAR3- 35 BSPLP DI	16				26			3	36	
7 <b>)</b>	RSAR3-0.5 B SPLP DIM	<b>S</b> 17				27			]3	37	
8 😽	J MSD	18				28			3	38	
9		19				29			3	39	
10		20				30				10	

Notes:	 	 	
		 	_

# VALIDATION FINDINGS WORKSHEET

METHOD: / GC HPLC

8310	8330	8151	(8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,l)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
l. Chrysene	l. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethton	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	°O.		O. Chlorpyrifos	JJ. Thionazin	
P. Pyrene	a.		P. Fenthion	í	
Ö.	ď		Q. Parathion-ethyl	0	ocehoro this ate
ж.			R. Trichloronate	ı	
S.			S. Merphos	NN. Carbo pheno thion	20
		-	T. Stirofos		ion - methul
	·		U. Tokuthion		

cmpd\_list.wpd

21937E17 the Cons SDG #: LDC #:

# VALIDATION FINDINGS WORKSHEET Continuing Calibration

Reviewer:\_ Page: 2nd Reviewer:

METHOD: /GC HPLC

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

What type of continuing calibration calculation was performed? / %D or \_ %R

Did the continuing calibration standards meet the %D / %R validation criteria of <20.0% / 80-120%? Were continuing calibration standards analyzed at the required frequencies?

Y N N/A

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

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
	9/29/69	010 7 100 1	- 33	B C)	30.8	( )	A11 + B11ES	5-MJA (C)
	<u> </u>	L	4.73	B C	21.7	( )		,
		,			,	( )		
						( )		
	10/12/69		en, )	F (-)	58,0	( )		
	,	(ea)		C) M	20.8			
		<b>、</b> ノ	61.2	(-) J	57.3	( )		
						( )	<b>A</b>	<b>.</b>
						( )		
						(		
						( )		
						( )		
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						( )		
						(		

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

October 5 through October 7, 2009

LDC Report Date:

November 21, 2009

Matrix:

Soil

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304636

# Sample Identification

RSAQ4-10B

RSAQ4-32B

SA192-0.5B

SA192-10B

SA192-39B

SA192-10BMS

SA192-10BMSD

### Introduction

This data review covers 7 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

#### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination  $(r^2)$  was greater than or equal to 0.990.

#### b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0% with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/13/09	035F3501	1	Naled	35.6	RSAQ4-10B 9281219-BLK	J- (all detects) UJ (all non-detects)	A
10/13/09	035F3501	2	Naled	41.3	RSAQ4-10B 9281219-BLK	J- (all detects) UJ (all non-detects)	А
10/19/09	020F2001	1	Naled	20.6	RSAQ4-32B SA192-0.5B SA192-10B SA192-39B 9288187-BLK 9285484-BLK	J- (all detects) UJ (all non-detects)	A
10/19/09	020F2001	2	Ethoprop	20.1	RSAQ4-32B SA192-0.5B SA192-10B SA192-39B 9288187-BLK 9285484-BLK	J+ (all detects)	А

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/19/09	020F2001	2	Naled	21.4	RSAQ4-32B SA192-0.5B SA192-10B SA192-39B 9288187-BLK 9285484-BLK	J- (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304636	J- (all detects) UJ (all non-detects)	А
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304636	J- (all detects) UJ (all non-detects)	А

### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Accuracy and Precision Data

## a. Surrogate Recovery

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

# b. Matrix Spike/Matrix Spike Duplicates

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

## c. Laboratory Control Samples

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

# V. Target Compound Identification

Raw data were not reviewed for this SDG.

# VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304636	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

# VII. System Performance

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304636

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304636	RSAQ4-10B RSAQ4-32B SA192-0.5B SA192-10B SA192-39B	Naled	J- (all detects) UJ (all non-detects)	А	Continuing calibration (%D) (c)
8304636	RSAQ4-32B SA192-0.5B SA192-10B SA192-39B	Ethoprop	J+ (all detects)	А	Continuing calibration (%D) (c)
8304636	RSAQ4-10B RSAQ4-32B SA192-0.5B SA192-10B SA192-39B	Mevinphos	J- (all detects) UJ (all non-detects)	Α	Continuing calibration (ICV %D) (c)
8304636	RSAQ4-10B RSAQ4-32B SA192-0.5B SA192-10B SA192-39B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304636

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304636

No Sample Data Qualified in this SDG

# **Tronox Northqate Henderson**

LDC #: 21937F17	VALIDATION COMPLETENESS WORKSHEET	Date: 11/17/09
SDG #: 8304636	Stage 2B	Page: <u>l</u> of <u>l</u>
Laboratory: Test America		Reviewer: 3V6
•		2nd Reviewer:
METHOD: OO Our and a sub-	Darticides (EDA CVA) 946 Method 9141A)	

METHOD: GC Organophosphorus Pesticides (EPA SW 846 Method 8141A)

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

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 10/05-07/09  2 RSD = 207 r  COV/100 = 207
IIa.	Initial calibration	A	2 RSD = 207 r
lib.	Calibration verification/ICV	SW	COV/100 € 20 }
111.	Blanks	A	
IVa.	Surrogate recovery	À	
IVb.	Matrix spike/Matrix spike duplicates	Á	D9J030136-001 LCS/D
IVc.	Laboratory control samples	A	US/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

A = Acceptable Note:

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

D = Duplicate TB = Trip blank

FB = Field blank EB = Equipment blank

Validated Samples:

5011

	301]				
1 1	RSAQ4-10B	11 )	9281219-Blk	21	31
2 7	RSAQ4-32B	12 >	9288187-13/10	22	32
3 3	SA192-0.5B	13 3	لنظ الديد ميص	23	33
<del>-</del> 3	SA192-10B	14		24	34
<u>5</u> 3	SA192-39B	15		25	35
6	SA192-10BMS	16		26	36
7	SA192-10BMSD	17		27	37
8		18		28	38
9		19		29	39
10		20		30	40

Notes:		

# VALIDATION FINDINGS WORKSHEET

METHOD: /GC HPL

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensuifothion	V Rentene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mavinnhoe	W Defeter	, ,
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C, Demeton-O	w. Bolstar X EPN	CC. Toluene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	X Azimhor method	1.
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Commanhos	BDD MD Vulono
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naied	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
1. Chrysene	l. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowi	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	o.		O. Chlorpyrifos	JJ. Thionazin	
P. Pyrene			P. Fenthion	l	
Ġ.	G		Q. Parathion-ethyl	11. 000-Triethylphocoparathingto	se horo this ate
Ж.			R. Trichloronate		
S.			S. Merphos		02
			T. Stirofos	00. Carbo pheno thism - mtthu	on - methul
			U. Tokuthion		

Notes:

LDC#: 21937 F 17 SDG #:

# **VALIDATION FINDINGS WORKSHEET** Continuing Calibration

Page: lof\_ Reviewer: 2nd Reviewer:

METHOD: GC .. HPLC

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

What type of continuing calibration calculation was performed? %D or %R Were continuing calibration standards analyzed at the required frequencies?

Did the continuing calibration standards meet the %D / %R validation criteria of <20.0% / 80-120%? Y N N'A

Level IV-Only

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

	را																							
Qualifications	J-/N3/A (	,			J-/MI/A				J-/M5/A	J+dets/A	J-/MJ/A													
Associated Samples	A11 + B1ks		•		1, 9281219 - 1211	7			+718-18188cb 42	928 54 BA-BIR	7													
RT (limit)		( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	)	(	( )	(	(	( )	( )	( )	( )	( )	( )	( )
%D (Limit ≤ 20.0)	30.8	7.10			2.26	41.3			20.6		4.14													
Compound	(-) G		`		(-) 4	(-) ]			<b>(-)</b> ↓	(+) <u>A</u>	(I) 4													
Detector/ Column	7	C.Y.			col. 1	5, 75			SJ. )	4.13	->	•												
Standard ID	010 = 1001	( W)	\ \		0357361	(cm)			620 F200)	(ca)														
Date	9/29/69	,			10/13/69	, ,			10/9/69															
#																								

# Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

**Collection Date:** 

October 5, 2009

LDC Report Date:

November 21, 2009

Matrix:

Soil

Parameters:

Organophosphorus Pesticides

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 8304637

# Sample Identification

RSAQ4-10BSPLP

RSAQ4-32BSPLP

RSAQ4-10BSPLPMS

RSAQ4-10BSPLPMSD

RSAQ4-10BSPLPDI

RSAQ4-32BSPLPDI

RSAQ4-32BSPLPDIMS

RSAQ4-32BSPLPDIMSD

#### Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8141A for Organophosphorus Pesticides.

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 Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

### a. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r²) was greater than or equal to 0.990.

## b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were less than or equal to 20.0% with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/13/09	047F4701	1	Naled	39.3	All samples in SDG 8304637	J- (all detects) UJ (all non-detects)	А
			Ronnel	20.9		J- (all detects) UJ (all non-detects)	
10/13/09	047F4701	2	Naled	28.6	All samples in SDG 8304637	J- (all detects) UJ (all non-detects)	Α

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	1	Mevinphos	30.8	All samples in SDG 8304637	J- (all detects) UJ (all non-detects)	А

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
9/29/09	010F1001	2	Mevinphos	21.7	All samples in SDG 8304637	J- (all detects) UJ (all non-detects)	A

#### III. Blanks

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

No field blanks were identified in this SDG.

# IV. Accuracy and Precision Data

# a. Surrogate Recovery

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

# b. Matrix Spike/Matrix Spike Duplicates

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

# c. Laboratory Control Samples

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

# V. Target Compound Identification

Raw data were not reviewed for this SDG.

# VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 8304637	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

# VII. System Performance

Raw data were not reviewed for this SDG.

# VIII. Overall Assessment of Data

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

# IX. Field Duplicates

No field duplicates were identified in this SDG.

# Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Data Qualification Summary - SDG 8304637

SDG	Sample	Compound	Flag	A or P	Reason (Code)
8304637	RSAQ4-10BSPLP RSAQ4-32BSPLP RSAQ4-10BSPLPDI RSAQ4-32BSPLPDI	Naled Ronnel	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	А	Continuing calibration (%D) (c)
8304637	RSAQ4-10BSPLP RSAQ4-32BSPLP RSAQ4-10BSPLPDI RSAQ4-32BSPLPDI	Mevinphos	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D) (c)
8304637	RSAQ4-10BSPLP RSAQ4-32BSPLP RSAQ4-10BSPLPDI RSAQ4-32BSPLPDI	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Laboratory Blank Data Qualification Summary - SDG 8304637

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organophosphorus Pesticides - Field Blank Data Qualification Summary - SDG 8304637

No Sample Data Qualified in this SDG

# **Tronox Northaate Henderson**

DC #: 21937G17 _	VALIDATION COMPLETENESS WORKSHEET	Date: <u>II/17 / 6</u> 9
SDG #: 8304637	Stage 2B	Page: 1 of 1 Reviewer: 5V4
aboratory: Test Amer	ca	Reviewer: 3VG 2nd Reviewer:
		Zild Neviewer

METHOD: GC Organophosphorus Pesticides (EPA SW 846 Method 8141A)

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: 10/05/09  2 R(D 4 > 0 > T T CON/IN 4 20 >
lla.	Initial calibration	A	2 RSD 6 20 2 r2
IIb.	Calibration verification/ICV	SW	CON/N = 20 }
Ш,	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N_	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
Χ.	Field blanks	N	

Note:

A = Acceptable N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples:

	Soil			
1 1	RSAQ4-10BSPLP	- 111 9282413-BK	21	31
2	RSAQ4-32BSPLP	12 2 9 28 24 11 - BAC	22	32
3 1	RSAQ4-10BSPLPMS	13	23	33
4 1	RSAQ4-10BSPLPMSD	14	24	34
5 <b>&gt;</b>	RSA Q4-10BSPLP DI	15	25	35
6 <b>&gt;</b>	RS AQ4- 32 B SPLP DI	16	26	36
7 2	RSAQ4- 32B SPLPDIMS	17	27	37
8 >	Msp	18	28	38
9	•	19	29	39
10		20	30	40

Notes:	

# VALIDATION FINDINGS WORKSHEET

METHOD: /GC HPLC

8310	8330	8151	(8141	8141(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzena
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W Roleter	1'
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xviene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	l. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate	DD. Triffuralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (slivex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	Ö		O. Chlorpyrifos	JJ. Thionazin	
P. Pyrene	a:		P. Fenthion	1	
Ö	ď		Q. Parathion-ethyl	0	oc phono this sta
R,			R. Trichioronate	1	3.14.5.1.4.6
S.			S. Merphos		S
			T. Stirofos		m - m+4m/
	·		U. Tokuthion		

Notes:

LDC# 2/927 6 17 SDG #:\_\_

# VALIDATION FINDINGS WORKSHEET Continuing Calibration

Reviewer: 2nd Reviewer:

Page: of

METHOD: CGC HPLC

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

Mhat type of continuing calibration calculation was performed? \_\_\_\_\_の0 or \_\_\_\_

Were continuing calibration standards analyzed at the required frequencies?

Did the continuing calibration standards meet the %D / %R validation criteria of <20.0% / 80-120%?

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

Qualifications J-MIA Associated Samples BIRS AII RT (limit) (Limit  $\leq 20.0$ ) 39.3 20,9 28.6 21.7 30.8 4 F N C B (C) Compound B (-) 02.7 Columb 3, ا. ت Detector 3 Standard ID 0477470 ( 2) 016 F160 1 3 10/12/69 120/00/ Date 4