

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

Formaldehyde

LDC

Laboratory Data Consultants, Inc. Data Validation Report

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

Collection Date: August 4, 2009

LDC Report Date: December 1, 2009

Matrix: Water

Parameters: Formaldehyde

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904290

Sample Identification

FB080409-GW

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8315A for Formaldehyde.

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 as required by the method.

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

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 20.0% QC limits.

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	Detector	Compound	%D	Associated Samples	Flag	A or P
5/12/09	Z0002328	HPLC	Formaldehyde	28	All samples in SDG R0904290	J+ (all detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No formaldehyde was found in the method blanks.

Sample FB080409-GW was identified as a field blank. No formaldehyde was found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

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 R0904290	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
Formaldehyde - Data Qualification Summary - SDG R0904290**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
R0904290	FB080409-GW	Formaldehyde	J+ (all detects)	A	Continuing calibration (ICV %D) (c)
R0904290	FB080409-GW	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 21991A71
 SDG #: R0904290
 Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

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

METHOD: HPLC Formaldehyde (EPA SW 846 Method 8315A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/04/09
IIa.	Initial calibration	A	✓
IIb.	Calibration verification/ICV	SW	COV/ICV ≤ 20%
III.	Blanks	A	
IVa.	Surrogate recovery	N	Not req'd.
IVb.	Matrix spike/Matrix spike duplicates	N	Client spec
IVc.	Laboratory control samples	A	ICS /b
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	TB = 1

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

Validated Samples:

Water

1	FB080409-GW	11		21		31	
2	92934-MB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 21991 A71
SDG #: Set copy
METHOD: GC / HPLC

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

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

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

N 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 $\leq 20.0\%$ / $80-120\%$?

Level IV-0 only

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
	<u>5/12/09</u>	<u>2002328</u> <u>(10u)</u>	<u>HPLC</u>	<u>Formaldehyde (+)</u>	<u>28</u>	()	<u>All + Blk</u>	<u>J+ MTS/A (C)</u>
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