

ENVIRONMENTAL
Analytical Service Inc.

December 16, 2010
Sample Delivery Groups (SDG): 210490

Derrick Willis
Northgate Environmental Management, Inc.
300 Frank H Ogawa Pl. STE 510
Oakland, CA 94617

Dear Derrick:

Enclosed is the analytical report for the samples received and analyzed by Environmental Analytical Service, Inc. for the following project:

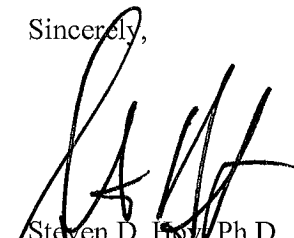
Project Name: Tronox
Project Number: 2027.06.32
Date Sampled: 12/9/10

The report consists of the following sections:

- I. Sample Description
- II. Laboratory Narrative and Chain of Custody Forms
- III. Laboratory Certification
- IV. Quality Control Reports
- V. Analytical Results

If you have any questions on the report or the analytical data please contact me at (805) 781-3585.

Sincerely,



Steven D. Hoy Ph.D.
Laboratory Director

SDH/lms

Analytical Report

SDG Number 210490

Client: Northgate Environmental Management

Date Received: 12/9/2010

I. SAMPLE DESCRIPTION AND ANALYSIS REQUESTED

Client Sample No.	EAS Lab No	Analysis Requested	Date Sample
RZ-E-02_Air_Sample	210490 1	EPA TO-15 Full Scan (Up to 25 Compounds)	12/9/2010

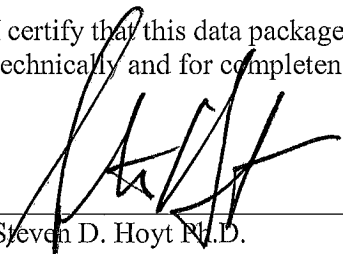
II. LABORATORY CASE NARRATIVE and CHAIN OF CUSTODY FORMS

SDG Numbers: 210490
Analysis performed for: Northgate Environmental Management, Inc.

All laboratory quality control criteria were met for the samples in this report except:

III. LABORATORY CERTIFICATION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the condition noted above.



Steven D. Hoyt Ph.D.
Laboratory Director

IV. QUALITY CONTROL REPORT

SDG Numbers: 210490
Client: Northgate Environmental Management, Inc.

LABORATORY QC REPORT

QC NARRATIVE

Unless project specific QC was specified, these samples were analyzed with the standard EAS QC for the method as defined in the EAS Quality Manual.

STANDARD LABORATORY QC REPORT

Unless project specific QC reporting was requested, this Section contains the standard laboratory QC supplied with the analytical reports, which includes the daily method blank and the daily duplicate control samples as described below. Each day that samples are analyzed comprises a Daily Analytical Batch for a particular instrument. A Daily Analytical Batch QC report will be supplied for each method and each day samples from this SDG Group were analyzed.

METHOD BLANK

A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples. A copy of each batch Method Blank is included with the report. If a compound is detected in the Method Blank between the RL and MDL, it will be flagged with a "J". If a compound is above the RL, it will be flagged with a "B"

DUPLICATE CONTROL SAMPLES

A duplicate or duplicate control sample (DCS) was analyzed as part of each daily analytical batch. A DCS is a well-characterized matrix (blank water, ambient air, or actual sample) which may or may not be spiked and run in duplicate with your sample batch. The results are on the attached Duplicate Sample/Spike results. Precision is measured in a duplicate test by Relative Percent Difference (RPD) as in:

$$\text{RPD} = \frac{[\% \text{ Recovery Test 1} - \% \text{ Recovery Test 2}] \times 100}{(\% \text{ Recovery Test 1} + \% \text{ Recovery Test 2}) / 2}$$

METHOD BLANK REPORT

EPA Method TO-15 Modified Full Scan GC/MS

Analytical Method: TO-15

SDG: LABQC

Laboratory Number: B12100

File: CC660A.D
Description: METHOD BLANK
Can/Tube#:
Sam_Type: MB
QC_Batch: 121010-MSC
Air Volume: 500 ml

Date Sampled:
Date Received:
Date Extracted:
Date Analyzed: 12/10/10
Can Dilution Factor: 1.00
Not Detected Flag: ND
Time: 12:42
2

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
67-66-3	Chloroform	0.20	0.51	ND	1.03	2.57	ND	ND
71-43-2	Benzene	0.21	0.52	ND	0.68	1.70	ND	ND
56-23-5	Carbon tetrachloride	0.20	0.51	ND	1.32	3.31	ND	ND
79-01-6	Trichloroethene	0.21	0.52	ND	1.14	2.86	ND	ND
127-18-4	Tetrachloroethene	0.20	0.51	ND	1.43	3.57	ND	ND
	Surrogate Recovery		Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out	
2037-26-5	Toluene-d8		10.00	9.94	99	70-130		

- Notes: 1) Reported results are to be interpreted to two significant figures.
 2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
 3) MDL and RL are adjusted for sample volume and can dilution.
 4) U and ND are Flags used for Not Detected
 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

METHOD BLANK REPORT

EPA Method TO-15 Modified Full Scan GC/MS
Analytical Method: TO-15

SDG: LABQC
Laboratory Number: B12100

File: CC660A.D
Description: METHOD BLANK
Can/Tube#:
Sam_Type: MB
QC_Batch: 121010-MSC
Air Volume: 10 ml

Date Sampled:
Date Received:
Date Extracted:
Date Analyzed: 12/10/10
Can Dilution Factor: 1.00
Not Detected Flag: ND
Time: 12:42
1

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
108-90-7	Chlorobenzene	10.2	25.5	ND	48.5	121.3	ND	ND
541-73-1	1,3-Dichlorobenzene	10.2	25.5	ND	63.3	158.3	ND	ND
106-46-7	1,4-Dichlorobenzene	10.2	25.5	ND	63.3	158.3	ND	ND
95-50-1	1,2-Dichlorobenzene	10.0	25.0	ND	62.1	155.2	ND	ND
Surrogate Recovery		Spike Amt. ppbV		Amount ppbV	% Rec.	QC Limits	Flag * = Out	
2037-26-5	Toluene-d8	10.00		9.94	99	70-130		

- Notes: 1) Reported results are to be interpreted to two significant figures.
 2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
 3) MDL and RL are adjusted for sample volume and can dilution.
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 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

QUALITY CONTROL DUPLICATE

Duplicate of QC Sample

EPA Method TO-15 Modified Full Scan GC/MS
Analytical Method: TO-15

SDG: LABQC

Dup File: QC12100B.D
Description: ST60025
Can/Tube#:
QC_Batch: 121010-MS

CAS#	Compound	LCD ppbv	LCS ppbv	RPD %D	Limit %	Flag * = Out
75-01-4	Vinyl chloride	5.07	5.13	1	25	
75-35-4	1,1-Dichloroethene	4.23	4.41	4	25	
75-09-2	Dichloromethane	4.94	5.17	4	25	
75-34-3	1,1-Dichloroethane	4.85	4.99	3	25	
67-66-3	Chloroform	4.74	4.76	0	25	
71-55-6	1,1,1-Trichloroethane	4.80	4.87	1	25	
107-06-2	1,2-Dichloroethane	4.80	4.93	3	25	
71-43-2	Benzene	5.03	5.00	1	25	
56-23-5	Carbon tetrachloride	4.77	4.76	0	25	
79-01-6	Trichloroethene	4.80	4.74	1	25	
108-88-3	Toluene	4.85	4.87	0	25	
127-18-4	Tetrachloroethene	4.78	4.61	3	25	
100-41-4	Ethylbenzene	5.49	5.30	4	25	
1330-20-7	m,p-Xylenes	10.96	10.17	8	25	
95-47-6	o-Xylene	5.49	5.16	6	25	
108-67-8	1,3,5-Trimethylbenzene	6.08	5.22	16	25	

QUALITY CONTROL REPORT

LABORATORY CONTROL SPIKE

EPA Method TO-15 Modified Full Scan GC/MS
Analytical Method: TO-15

SDG: LABQC

File: QC12100A.D
Description: ST60025
Can/Tube#:
Sam_Type: LCS
QC_Batch: 121010-MS
Air Volume: 1000 ml

Date Sampled: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 12/10/10 Time: 10:09
Can Dilution Factor: 1.00 2
QC Duplicate: No

CAS#	Compound	MDL ppbv	Spike Conc ppbv	Amount ppbv	Matrix Amt ppbv	Spk Amt ppbv	Percent Recovery	LCL %	UCL %	Flag
75-01-4	Vinyl chloride	0.10	5.20	5.13	0.000	5.13	99	70	130	
75-35-4	1,1-Dichloroethene	0.10	5.05	4.41	0.000	4.41	87	70	130	
75-09-2	Dichloromethane	0.10	5.20	5.17	0.000	5.17	99	70	130	
75-34-3	1,1-Dichloroethane	0.10	5.05	4.99	0.000	4.99	99	70	130	
67-66-3	Chloroform	0.10	5.10	4.76	0.000	4.76	93	70	130	
71-55-6	1,1,1-Trichloroethane	0.10	5.10	4.87	0.000	4.87	95	70	130	
107-06-2	1,2-Dichloroethane	0.10	5.15	4.93	0.000	4.93	96	70	130	
71-43-2	Benzene	0.10	5.15	5.00	0.000	5.00	97	70	130	
56-23-5	Carbon tetrachloride	0.10	5.10	4.76	0.000	4.76	93	70	130	
79-01-6	Trichloroethene	0.10	5.15	4.74	0.000	4.74	92	70	130	
108-88-3	Toluene	0.10	5.15	4.87	0.000	4.87	95	70	130	
127-18-4	Tetrachloroethene	0.10	5.10	4.61	0.000	4.61	90	70	130	
100-41-4	Ethylbenzene	0.10	5.20	5.30	0.000	5.30	102	70	130	
1330-20-7	m,p-Xylenes	0.21	10.30	10.17	0.000	10.17	99	70	130	
95-47-6	o-Xylene	0.10	5.10	5.16	0.000	5.16	101	70	130	
108-67-8	1,3,5-Trimethylbenzene	0.11	5.30	5.22	0.000	5.22	98	70	130	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	10.046	100	70-130	

Notes: Reported results are to be interpreted to two significant figures.
*ug/m3 calculated assuming conditions at 60 F and 1 atm.

QUALITY CONTROL REPORT

LABORATORY CONTROL DUPLICATE

EPA Method TO-15 Modified Full Scan GC/MS
Analytical Method: TO-15

SDG: LABQC

File: QC12100B.D
Description: ST60025
Can/Tube#:
Sam_Type: LCD
QC_Batch: 121010-MSD
Air Volume: 1000 ml

Date Sampled: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 12/10/10 Time: 11:06
Can Dilution Factor: 1.00 2
QC Duplicate: Yes

CAS#	Compound	MDL ppbv	Spike Conc ppbv	Amount ppbv	Matrix Amt ppbv	Spk Amt ppbv	Percent Recovery	LCL %	UCL %	Flag
75-01-4	Vinyl chloride	0.10	5.20	5.07	0.000	5.07	98	70	130	
75-35-4	1,1-Dichloroethene	0.10	5.05	4.23	0.000	4.23	84	70	130	
75-09-2	Dichloromethane	0.10	5.20	4.94	0.000	4.94	95	70	130	
75-34-3	1,1-Dichloroethane	0.10	5.05	4.85	0.000	4.85	96	70	130	
67-66-3	Chloroform	0.10	5.10	4.74	0.000	4.74	93	70	130	
71-55-6	1,1,1-Trichloroethane	0.10	5.10	4.80	0.000	4.80	94	70	130	
107-06-2	1,2-Dichloroethane	0.10	5.15	4.80	0.000	4.80	93	70	130	
71-43-2	Benzene	0.10	5.15	5.03	0.000	5.03	98	70	130	
56-23-5	Carbon tetrachloride	0.10	5.10	4.77	0.000	4.77	94	70	130	
79-01-6	Trichloroethene	0.10	5.15	4.80	0.000	4.80	93	70	130	
108-88-3	Toluene	0.10	5.15	4.85	0.000	4.85	94	70	130	
127-18-4	Tetrachloroethene	0.10	5.10	4.78	0.000	4.78	94	70	130	
100-41-4	Ethylbenzene	0.10	5.20	5.49	0.000	5.49	106	70	130	
1330-20-7	m,p-Xylenes	0.21	10.30	10.96	0.000	10.96	106	70	130	
95-47-6	o-Xylene	0.10	5.10	5.49	0.000	5.49	108	70	130	
108-67-8	1,3,5-Trimethylbenzene	0.11	5.30	6.08	0.000	6.08	115	70	130	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	9.692	97	70-130	

Notes: Reported results are to be interpreted to two significant figures.
*ug/m3 calculated assuming conditions at 60 F and 1 atm.

V. ANALYTICAL RESULTS

SDG Numbers: 210490
Client: Northgate Environmental Management, Inc.

The following pages contain the certified reports for the analytical methods and the compounds requested. The reports are in order of analytical method then EAS ID number. A brief description of the units that appear on the reports is given below:

ppbV, ppmV, Percent

Parts per billion by volume (also known as mole ratio) and other related units. This is the primary reporting unit for all volatile organic compound analysis except the hydrocarbon speciation and total hydrocarbons. This unit is independent of temperature and pressure.

$$\text{ppbV} = \frac{\text{nanomoles of compound}}{\text{moles of air}}$$

ug/m3, mg/m3

Micrograms of compound per cubic meter of air and other related units. This is the primary reporting unit for semi volatile organic compounds. It is not a primary reporting unit for volatile organic compounds because it is temperature and pressure dependent, so the result will vary depending on the conditions when the sample was collected. EAS provides the units on its analytical reports as a convenience to the client, but they should be used with caution. The following equation can be used to convert from ppbV to ug/m3.

$$\text{ug/m3} = \frac{\text{ppbV} \times \text{MW compound}}{23.68}$$

23.68 is the molar volume of a gas at 60 F and 1 atm pressure

ppbC, ppmC

Parts per billion by volume as carbon (methane) and other related units. This unit is the primary reporting unit for hydrocarbon analysis, even if it does not appear on the report. This unit is used because the flame ionization detector response is proportional to the number of carbons in the compound, so an accurate concentration can be reported even if the identification of the compound is not known.

$$\text{ppbC} = \text{ppbV} \times \text{number of carbons in compound}$$

ANALYTICAL REPORT

EPA Method TO-15 Modified Full Scan GC/MS
Analytical Method: TO-15

SDG: 210490
Laboratory Number: 01

File: 1049001B.D
Description: RZ-E-02-AIR-SAMPLE
Can/Tube#: 863
Sam_Type: SA
QC_Batch: 121010-MSC
Air Volume: 500 ml

Date Sampled: 12/09/10 Time: 16:25
Date Received: 12/09/10
Date Extracted:
Date Analyzed: 12/10/10 Time: 16:54
Can Dilution Factor: 1.30 2
Not Detected Flag: ND

CAS#	Compound	MDL	RL	Amount	MDL	RL	Amount	Flag
		ppbv	ppbv	ppbv	ug/m3	ug/m3	ug/m3	
67-66-3	Chloroform	0.27	0.66	3.29	1.34	3.34	16.61	
71-43-2	Benzene	0.27	0.67	ND	0.88	2.21	ND	ND
56-23-5	Carbon tetrachloride	0.27	0.66	ND	1.72	4.31	ND	ND
79-01-6	Trichloroethene	0.27	0.67	ND	1.49	3.72	ND	ND
127-18-4	Tetrachloroethene	0.27	0.66	ND	1.86	4.64	ND	ND

Surrogate Recovery		Spike Amt.	Amount	% Rec.	QC	Flag
		ppbV	ppbV		Limits	* = Out
2037-26-5	Toluene-d8	10.00	9.25	92	70-130	

- Notes: 1) Reported results are to be interpreted to two significant figures.
 2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
 3) MDL and RL are adjusted for sample volume and can dilution.
 4) U and ND are Flags used for Not Detected
 5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

ANALYTICAL REPORT

EPA Method TO-15 Modified Full Scan GC/MS

Analytical Method: TO-15

SDG: 210490

Laboratory Number: 01

File: 1049001A.D

Date Sampled: 12/09/10 Time: 16:25

Description: RZ-E-02-AIR-SAMPLE

Date Received: 12/09/10

Can/Tube#: 863

Date Extracted:

Sam_Type: SA

Date Analyzed: 12/10/10 Time: 16:11

QC_Batch: 121010-MS

Can Dilution Factor: 1.30 1

Air Volume: 10 ml

Not Detected Flag: ND

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
108-90-7	Chlorobenzene	13.3	33.2	123.0	63.1	157.6	584.7	
541-73-1	1,3-Dichlorobenzene	13.3	33.2	ND	82.3	205.8	ND	ND
106-46-7	1,4-Dichlorobenzene	13.3	33.2	88.6	82.3	205.8	550.2	
95-50-1	1,2-Dichlorobenzene	13.0	32.5	52.9	80.7	201.8	328.6	
	Surrogate Recovery		Spike Amt. ppbV		Amount ppbV	% Rec.	QC Limits	Flag * = Out
2037-26-5	Toluene-d8		10.00		9.16	92	70-130	

- Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Qualifiers

*	See Case Narrative
B	This compound was detected in the blank above the Reporting Limit (RL)
D	This report was calculated from a secondary dilution factor
E	Compound exceeds the calibration range and is an estimated value
J	The amount reported is an estimated value because it is between the Reporting Limit (RL) and the Method Detection Limit (MDL)
F	Higher detection limit due to sample matrix
G	Higher detection limit due to limited sample size
Q	Compound secondary ion ratio qualifiers are outside the standard acceptance criteria
R	Compound secondary retention time (RT) is outside the acceptance criteria for the method
U	Compound is less than the Method Detection Limit (MDL)

Abbreviations

MDL Minimum Detection Limit – Instrument detection limit

The minimum detectable level (MDL) is the lowest concentration of a substance that can be measured with confidence. The MDL is calculated at the 99% confidence level from seven repetitive measurements on a sample whose concentration does not exceed 10 times the estimated MDL (Glasser et. al. 1981; Long and Winefordner, 1983). Generating an MDL study, a sample is prepared in the appropriate matrix with components near the estimated MDL, which is about 3 times the instrument noise level. This sample is run seven consecutive times and the standard deviation (S) is calculated. The MDL is determined using the following formula: $MDL = 3.14 * S$

ND Not Detected – a reported limit

NA Not Applicable

RPD Relative Percent Difference

The relative percent difference for a pair of duplicate samples is calculated from repetitive runs on sample pairs representative of the types of samples that are analyzed. The RPD provides information on the precision or reproducibility of the actual measurement process. The RPD is calculated for a particular compound from the average using the following formula:

$$RPD(\%) = \frac{\text{Difference} * 100}{\text{Average}}$$

RSD Relative Standard Deviation

The relative standard deviation is reported as a percentage deviation at a particular concentration using the following equation:

$$RSD (\%) = \frac{S * 100}{\text{Average}}$$

Definitions

$$ppbV = \frac{\# \text{ nanomoles cmpd}}{\# \text{ moles air}} = \frac{ppbC}{\# \text{ carbons in cmpd}}$$

Compound is reported as ppb of compound by Volume

This unit is temperature independent

$$ug/m^3 = ppbV \times \frac{MW \text{ compound}}{23.68}$$

Compound is reported as ug of a compound in a m³ of air

23.68 is the molar volume of a gas at 60 ° F and 1 atm pressure

MW = molecular weight

This unit is temperature dependent

$$ppbC = ppbV \times \# \text{ carbons in compound}$$