



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
ENVIRONMENTAL SCIENCE CENTER  
701 MAPES ROAD  
FORT MEADE, MARYLAND 20755-5350

DATE : July 15, 2009

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *CCW*  
Region III ESAT RPO (3EA20)

TO : Michael Towle  
Regional Project Manager (3HS31)

Attached is the organic data validation report for the Tank Car Corporation of America site (CASE # 38651; SDG # C06X4). This report has been completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachments

cc: Joshua Cope (TTEMI)

TO File #: 0021

TDF#: 07006

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

Lockheed Martin Enterprise Solutions & Services  
ESAT Region 3  
US EPA Environmental Science Center  
701 Mapes Road Ft. Meade, MD 20755-5350  
Telephone 410-305-3037 Facsimile 410-305-3597



**DATE:** July 13, 2009

**SUBJECT:** Level M2 Organic Data Validation for Case 38651  
SDG: C06X4  
Site: Tank Car Corporation of America

**FROM:** Kenneth W. Curry *KWC*  
Senior Data Reviewer

Mahboobeh Mecanic *MM*  
Senior Oversight Chemist

**TO:** Colleen Walling  
ESAT Region 3 Project Officer

### OVERVIEW

Case 38651, Sample Delivery Group (SDG) C06X4, from the Tank Car Corporation of America site consisted of four (4) waste samples analyzed for volatile and semivolatile compounds and one (1) trip blank analyzed for volatile compounds only by A4 Scientific (A4) in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) SOM01.2 through Routine Analytical Services (RAS) program.

### SUMMARY

Data were validated according to Innovative Approaches for Validation of Organic Data, Level M2. This level of review includes assessment of all Quality Assurance/Quality Control (QA/QC) data and review of chromatograms, but excludes review of spectra and raw data.

It should be noted that in SOM01.2, 1,4-dioxane is no longer a target analyte by Trace VOA and Trace VOA SIM analyses. Using SOM01.2 for the detection and reporting of 1,4-dioxane at low and medium levels has not consistently generated data of sufficiently known quality. This is due to poor purge efficiency. Results for 1,4-dioxane using this method should be considered advisory.

### MINOR PROBLEM

- In the volatile analyses, recoveries of DMCs listed below were outside the lower control limits in the samples given. The "L" qualifier for the methylene chloride positive result was superseded by "B". Quantitation limits for compounds associated with these DMCs in these samples were qualified "UL" on the DSFs

<u>DMC</u>	<u>Sample(s)</u>
2-butanone-d5	C06X4, C06X5, C06X6, C06X7
1,2-dichloroethane-d4	C06X4

**NOTES**

- Compounds detected below the Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSFs unless superseded by "B".
- 1,4-dioxane in the volatile continuing calibrations and benzaldehyde in the semivolatile continuing calibrations failed precision criteria [Percent Difference (%D)]. No positive results were reported for these compounds and these precisions did not exceed the fifty percent (50%) criteria. Therefore, no data were qualified based on these calibration outliers.
- Tentatively Identified Compounds (TICs) were reviewed during data validation. TICs identified as blank contaminants were crossed off the TIC Form Is. TIC Form Is for samples in which TICs were identified are included in Appendix E.
- Results reported for the field duplicate pair, C06X4/C06X5, were comparable.
- Concentrations of target compounds found in the analysis of samples' associated storage, method, rinsate, and trip blanks are listed below. Only compounds used to qualify data are listed. Samples with concentrations of common laboratory contaminants (\*) less than ten times (<10X) blank concentrations or concentrations of other contaminants less than five times (<5X) blank concentrations have been qualified "B" on the DSFs. Concentration units are in µg/L.

<u>Blank</u>	<u>Compound</u>	<u>Concentration</u>	<u>Affected Samples</u>
Storage (VHBLK01)	methylene chloride*	2.5 J	All Samples
Trip (C06X7)	toluene	1.1 J	C06X4, C06X5
Rinsate (C06X6)	bis(2-ethylhexyl)phthalate*	0.80 J	C06X4, C06X5, C06X8

All data for Case 38651, SDG C06X4, were reviewed in accordance with the Region 3 Innovative Approaches for Validation of Organic Data (Level M2), June 1995.

**ATTACHMENTS**

- Appendix A Glossary of Data Qualifier Terms
- Appendix B Data Summary Forms
- Appendix C Chain of Custody (COC) Records
- Appendix D Laboratory Case Narrative
- Appendix E Tentatively Identified Compounds (TIC) Form Is

DCN: 38651M2

## **Appendix A**

### **Glossary of Data Qualifiers**

## **GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)**

### CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NO CODE = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

### CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

### OTHER CODES

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

Q = No analytical result.

## **Appendix B**

### **Data Summary Forms**



DATA SUMMARY FORM: Volatiles

Case #: 38651

SDG : C06X4

Site :

TANK CAR CORPORATION OF AMERICA

Lab. :

A4

Sample Number :	C06X4	C06X5	C06X6	C06X7	C06X8						
Sampling Location :	TCCA-MW-06	TCCA-MW-07	TCCA-RB-01	TCCA-TB-02	TCCA-SW-01						
Field QC:	Field Dup. of C06X5	Field Dup. of C06X4	Rinsate Blank	Trip Blank							
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	6/12/2009	6/12/2009	6/12/2009	6/12/2009	6/15/2009						
Time Sampled :	08:45	08:57	11:57	08:12	10:22						
pH :	≤2.0	≤2.0	≤2.0	≤2.0	≤2.0						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
Volatile Compound	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
1,1,2-Trichloroethane	5.0										
*Tetrachloroethene	5.0	4.8	J	4.3	J						
2-Hexanone	10										
Dibromochloromethane	5.0										
1,2-Dibromoethane	5.0		UL								
*Chlorobenzene	5.0										
*Ethylbenzene	5.0										
o-Xylene	5.0	1.6	J	1.4	J						
m,p-Xylene	5.0	5.9		5.4							
*Styrene	5.0										
Bromoform	5.0										
Isopropylbenzene	5.0										
1,1,2,2-Tetrachloroethane	5.0										
*1,3-Dichlorobenzene	5.0										
*1,4-Dichlorobenzene	5.0										
1,2-Dichlorobenzene	5.0										
1,2-Dibromo-3-chloropropane	5.0										
1,2,4-Trichlorobenzene	5.0										
1,2,3-Trichlorobenzene	5.0										

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL \* Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: BNA

Case #: 38651

SDG : C06X4

Number of Soil Samples : 0

Site :

TANK CAR CORPORATION OF AMERICA

Number of Water Samples : 4

Lab. :

A4

Sample Number :		C06X4		C06X5		C06X6		C06X8			
Sampling Location :		TCCA-MW-06		TCCA-MW-07		TCCA-RB-01		TCCA-SW-01			
Field QC:		Field Dup. of C06X5		Field Dup. of C06X4		Rinsate Blank					
Matrix :		Water		Water		Water		Water			
Units :		ug/L		ug/L		ug/L		ug/L			
Date Sampled :		6/12/2009		6/12/2009		6/12/2009		6/15/2009			
Time Sampled :		08:45		08:57		11:57		10:22			
Dilution Factor :		1.0		1.0		1.0		1.0			
Semivolatile Compound	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Benzaldehyde	5.0										
Phenol	5.0										
Bis(2-Chloroethyl)ether	5.0										
2-Chlorophenol	5.0										
2-Methylphenol	5.0										
2,2'-Oxybis(1-chloropropane)	5.0										
Acetophenone	5.0										
4-Methylphenol	5.0										
N-Nitroso-di-n-propylamine	5.0										
Hexachloroethane	5.0										
Nitrobenzene	5.0										
Isophorone	5.0										
2-Nitrophenol	5.0										
2,4-Dimethylphenol	5.0										
Bis(2-chloroethoxy)methane	5.0										
2,4-Dichlorophenol	5.0										
Naphthalene	5.0	16		14							
4-Chloroaniline	5.0										
Hexachlorobutadiene	5.0										
Caprolactam	5.0										
4-Chloro-3-methylphenol	5.0					3.4	J				
2-Methylnaphthalene	5.0	2.0	J	1.7	J						
Hexachlorocyclopentadiene	5.0										
2,4,6-Trichlorophenol	5.0										
2,4,5-Trichlorophenol	5.0										
1,1'-Biphenyl	5.0										
2-Chloronaphthalene	5.0										
2-Nitroaniline	10										
Dimethylphthalate	5.0										
2,6-Dinitrotoluene	5.0										
Acenaphthylene	5.0										
3-Nitroaniline	10										
Acenaphthene	5.0	0.67	J	0.65	J						

Case #: 38651

SDG : C06X4

Site :

TANK CAR CORPORATION OF AMERICA

Lab. :

A4

Sample Number :		C06X4		C06X5		C06X6		C06X8			
Sampling Location :		TCCA-MW-06		TCCA-MW-07		TCCA-RB-01		TCCA-SW-01			
Field QC:		Field Dup. of C06X5		Field Dup. of C06X4		Rinsate Blank					
Matrix :		Water		Water		Water		Water			
Units :		ug/L		ug/L		ug/L		ug/L			
Date Sampled :		6/12/2009		6/12/2009		6/12/2009		6/15/2009			
Time Sampled :		08:45		08:57		11:57		10:22			
Dilution Factor :		1.0		1.0		1.0		1.0			
Semivolatile Compound	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
2,4-Dinitrophenol	10										
4-Nitrophenol	10										
Dibenzofuran	5.0	0.61	J	0.57	J						
2,4-Dinitrotoluene	5.0										
Diethylphthalate	5.0										
Fluorene	5.0	0.85	J	0.73	J						
4-Chlorophenyl-phenylether	5.0										
4-Nitroaniline	10										
4,6-Dinitro-2-methylphenol	10										
N-Nitrosodiphenylamine	5.0										
1,2,4,5-Tetrachlorobenzene	5.0										
4-Bromophenyl-phenylether	5.0										
*Hexachlorobenzene	5.0										
Atrazine	5.0										
*Pentachlorophenol	10										
Phenanthrene	5.0	1.2	J	1.1	J						
Anthracene	5.0										
Carbazole	5.0	0.74	J	0.73	J						
Di-n-butylphthalate	5.0					0.72	J				
Fluoranthene	5.0										
Pyrene	5.0										
Butylbenzylphthalate	5.0	2.2	J	2.0	J						
3,3'-Dichlorobenzidine	5.0										
Benzo(a)anthracene	5.0										
Chrysene	5.0										
Bis(2-ethylhexyl)phthalate	5.0	1.3	B	1.4	B	0.80	J	0.50	B		
Di-n-octylphthalate	5.0										
Benzo(b)fluoranthene	5.0										
Benzo(k)fluoranthene	5.0										
Benzo(a)pyrene	5.0										
Indeno(1,2,3-cd)pyrene	5.0										
Dibenzo(a,h)anthracene	5.0										
Benzo(g,h,i)perylene	5.0										
2,3,4,6-Tetrachlorophenol	5.0										

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL \* Dilution Factor)

Revised 09/99

## **Appendix C**

### **Chain of Custody (COC) Records**



**EPA USEPA Contract Laboratory Program  
Organic Traffic Report & Chain of Custody Record**

Case No: 38651  
DAS No: R

Region: 3	Date Shipped: 6/10/2009	Chain of Custody Record	
Project Code: CT4593	Carrier Name: FedEx	Relinquished By	Sampler Signature:
Account Code: PAN000306553	Airbill: 8574 9984 7968	Received By	(Date / Time)
Spill ID:	Shipped to: A4 Scientific	1	(Date / Time)
Site Name/State: TCCA June 09 VOC & SVOC/PA	1544 Sawdust Road	2	
Project Leader: Jordan Vaughn	Suite 505	3	
Action:	The Woodlands TX 77380	4	
Sampling Co: Tetra Tech	(281) 292-5277		

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
C06X4	Ground Water/ Jordan Vaughn	L/G	SVOCwater (14), TVOA (14)	TCCA2156 (HCL), TCCA2157 (HCL), TCCA2158 (HCL), TCCA2159, TCCA2160 (5)	TCCA-MW-06	8:45		
C06X5	Ground Water/ Jordan Vaughn	L/G	SVOCwater (14), TVOA (14)	TCCA2161 (HCL), TCCA2162 (HCL), TCCA2163 (HCL), TCCA2164, TCCA2165 (5)	TCCA-MW-07	8:57		Duplicate to TCCA-MW-06
C06X6	Ground Water/ Jordan Vaughn	L/G	SVOCwater (14), TVOA (14)	TCCA2166 (HCL), TCCA2167 (HCL), TCCA2168 (HCL), TCCA2169, TCCA2170 (5)	TCCA-RB-01	11:57		Rinsate blank
C06X7	Ground Water/ Jordan Vaughn	L/G	TVOA (14)	TCCA2171 (HCL), TCCA2172 (HCL), TCCA2173 (HCL) (3)	TCCA-TB-02	8:12		Trip Blank
C06X8	Surface Water/ Jordan Vaughn	L/G	SVOCwater (14), TVOA (14)	TCCA2174 (HCL), TCCA2175 (HCL), TCCA2176 (HCL), TCCA2177, TCCA2178 (5)	TCCA-SW-01	10:22		

*Scheduled as VOA's not trace VOA's JTS 7-1-09  
Documented in data package ROC's from lab 908MD.*

Shipment for Case Complete 7 N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: SVOCwater = SVOC water, TVOA = SOM01.2 TVOA	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____

**TR Number: 3-023200937-061509-0002**

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

**REGION COPY**

875 6-3-09

ASQAP USE ONLY	
RAS#	CT4593
DAS#	Analytical FAT
NSF#	14 DAYS

# U.S. EPA Region III Analytical Request Form

Revision 10-06

38651

Date: 6/2/09		Site Activity: Removal Site-Evaluations <i>Assessment</i>	
Site Name: Tank Car Corporation of America			
City: Orland		Street Address: 1725 Walnut Ave	
State: PA		Latitude:	
Acct. #: 2009 T03 N 302DC6C A3GXRS00		Longitude:	
Program: Superfund		CERCLIS #: PAN000 306 553	
Site ID:		Operable Unit:	
Site Specific QA Plan Submitted: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes		Title: START3 QAPP	
EPA Project Leader: Michael Towle		Phone#: 215-814-3272	
Request Preparer: JOSHUA COPE		Cell Phone #: 215-768-8114	
Site Leader: Jordan Vaughn		Cell Phone #: 215-651-4022	
Contractor: Tetra Tech EM Inc			
EPA CO/PO: Jeff Fang/Karen Wodarczyk			
#Samples 13	Matrix: water	Parameter: TCL VOC	Method: SOM01.2 <i>30691</i>
#Samples 11	Matrix: water	Parameter: TCL SVOC	Method: SOM01.2 <i>30692</i>
#Samples 11	Matrix: water	Parameter: TAL Metals & Hg	Method: ILM05.4 ICPAES & Hg <i>30695</i>
#Samples 4	Matrix: soil	Parameter: TCL SVOC	Method: SOM01.2 <i>30693</i>
#Samples 6	Matrix: soil	Parameter: TAL Metals & Hg	Method: ILM05.4 ICPAES & Hg <i>30694</i>
Ship Date From: 6/10/09		Ship Date To: 6/12/09	
Org. Validation Level M2		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input checked="" type="checkbox"/> 14days <input type="checkbox"/> 7days <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> Other (Specify) <i>PPS by ESA7</i>			
Validated Data Package Due: <input type="checkbox"/> 42 days <input checked="" type="checkbox"/> 30 days <input type="checkbox"/> 21days <input type="checkbox"/> 14 days <input type="checkbox"/> Other (Specify) <i>14/16</i>			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached Required Limits and CRQL/CRDLs Needed. * Analyze by ILM05.4 ICPAES & Hg. Report results in ug/wipe.			

Revision 1.1

## **Appendix D**

### Laboratory Case Narrative

Contract #: EPW05036	Case #: 38651	SDG #: C06X4
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SDG NARRATIVE

**SAMPLE RECEIPT & LOGIN**

The following samples were received on the dates listed against them. The samples were logged in for analysis as listed.

<u>Client Sample</u>	<u>Lab Sample</u>	<u>Matrix</u>	<u>#Cont.</u>	<u>Received</u>	<u>Analysis</u>	<u>Comments</u>
C06X4	0010483-01	Water	5	06/16/09 09:57	SOM01.2 VOA LOW  SOM01.2 SVOA	SDG FIRST SX
C06X5	0010483-02	Water	5	06/16/09 09:57	SOM01.2 VOA LOW  SOM01.2 SVOA	
C06X6	0010483-03	Water	5	06/16/09 09:57	SOM01.2 VOA LOW  SOM01.2 SVOA	
C06X7	0010483-04	Water	3	06/16/09 09:57	SOM01.2 VOA LOW	
C06X8	0010483-05	Water	5	06/16/09 09:57	SOM01.2 VOA LOW  SOM01.2 SVOA	

The cooler temperatures are listed against the coolers.

DATE RECEIVED	COOLER NO.	Temp (in °C)	Airbill No.
6/16/09	1	4	857499847968

The following issues were noted:

**Issue:** The TR/COC lists the analysis as TVOA and SVOA; however per scheduling the analysis should be VOA and SVOA.  
**Resolution:** Per Region 3, the laboratory has noted the issue, performed the analyses as indicated on the Scheduling Notification Form, and proceeded with the analysis of the samples.

Directive (email) is enclosed. No other discrepancies or issues were noted during sample receipt and login.

**VOLATILES LOW/MEDIUM**

Samples were analyzed using instrument C-5973.

Instrument C-5973 consisted of an Agilent 5973 GC/MS with a 25-meter long DB-624 (Agilent cat#128-1324) column having a 0.2mm ID and 1.12µm film thickness, Tekmar Purge and Trap Model LSC2000 with an Archon auto sampler. The trap used was a #10 trap (OI Cat# 258822) having an approximate composition of 40% Tenax, 30% Silica gel and 30% CMS.

All VOA samples had the pH characteristics verified. The reading is listed below.

000000001

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite505•The Woodlands, TX 77380•Phone (281) 292-5277

Contract #: EPW05036	Case #: 38651	SDG #: C06X4
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EPA SAMPLE #	LAB SAMPLE #	pH
C06X4	0010483-01	≤ 2
C06X5	0010483-02	≤ 2
C06X6	0010483-03	≤ 2
C06X7	0010483-04	≤ 2
C06X8	0010483-05	≤ 2

MS/MSD was not required.

Manual integrations were performed for the following samples for the compounds listed against them.

Compound	EPA Sample ID
Vinyl Chloride-d3	VSTD00550, VSTD01050
Chloroethane-d5	VSTD00550, VSTD01050
Dichlorodifluoromethane	VSTD00550, VSTD01050
Chloromethane	VSTD00550, VSTD01050
Vinyl Chloride	VSTD00550
Chloroethane	VSTD00550
Bromomethane	VSTD01050
2-Hexanone-d5	VSTD01050
Tetrachloroethene	VSTD00541
Trichlorofluoromethane	VSTD20041

These manual integrations were necessary because the software failed to accurately integrate the entire peak. In all the above instances, the quantitation reports are flagged with "m". A hard copy printout of the manual integration, the scan ranges, and initials of the analyst or manager is included in the data package.

**SEMI-VOLATILES**

1) **Extractions**

Water samples and associated blanks were extracted by continuous liquid-liquid extraction method. No problems were encountered during extraction.

2) **Analysis**

All samples were analyzed on an Agilent-5973 GC/MS using a 30-meter HP-5MS column (Agilent cat#19091S-433) having a 0.25mm ID and a 0.25µm film thickness. A 1µL injection was used.

MS/MSD was not required.

Manual integrations were performed for the following samples for the compounds listed against them.

Compound	EPA Sample ID
Phenol-d5	SSTD0057W, SSTD0107W, SSTD0407W, SSTD0807W, SSTD0207X, SSTD0207W, SSTD0207Y, SSTD0207Z, SSTD0208A, SBLK5J, C06X4, C06X5, C06X6, C06X8
Indeno (1, 2, 3-cd) pyrene	SSTD0057W, SSTD0107W, SSTD0807W, SSTD0207W, SSTD0207X, SSTD0207Y, SSTD0207Z, SSTD0207

0000000002

Contract #: EPW05036	Case #: 38651	SDG #: C06X4
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Benzo (k) fluoranthene	SSTD0207Z
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These manual integrations were necessary because the software failed to accurately integrate the entire peak. In all the above instances, the quantitation reports are flagged with "m". A hard copy printout of the manual integration, the scan ranges, and initials of the analyst or manager is included in the data package.

The following equations were used for calculation of the sample results from raw instrument output data:

**VOLATILES**

**Water (Low/Med. Trace & SIM):**

$$\text{Concentration } (\mu\text{g/L}) = \frac{(A_x)(I_s)(Df)}{(A_{is})(RRF)(V_o)}$$

$A_x$  = Area of the characteristic ion (EICP) for the compound to be measured.

$A_{is}$  = Area of the characteristic ion (EICP) for the internal standard.

$I_s$  = Amount of internal standard added in nanograms (ng).

$RRF$  = Mean relative response factor from the initial calibration.

$V_o$  = Total volume of water purged, in milliliters (mL).

$Df$  = Dilution factor.

**Semivolatiles:**

**Water**

$$\text{Concentration } (\mu\text{g/L}) = \frac{(A_x)(I_s)(V_t)(Df)(GPC)}{(A_{is})(RRF)(V_o)(V_i)}$$

$A_x$  = Area of the characteristic ion for the compound to be measured.

$A_{is}$  = Area of the characteristic ion for the internal standard.

$I_s$  = Amount of internal standard injected in nanograms (ng).

$RRF$  = Mean relative response factor determined from the initial calibration.

$V_o$  = Volume of water extracted in milliliters (mL).

$V_i$  = Volume of extracted infected in microliters ( $\mu\text{L}$ ).

$V_t$  = Volume of concentrated extract in microliters ( $\mu\text{L}$ ). ( $V_t = 1000\mu\text{L}$ ).

$Df$  = Dilution Factor.

$$GPC = \frac{V_{in}}{V_{out}} = \text{GPC Factor. (If, no GPC is performed, } GPC=1).$$

$V_{in}$  = Volume of extract loaded onto GPC column.

$V_{out}$  = Volume of extract collected after the GPC cleanup.

I certify that this Sample Data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy Sample Data Package and in the electronic data deliverable has been authorized by the laboratory Manager or Manager's designee, as verified by the following signature.

S. Vokati (Lab Director)

Signature and Title

06/29/09

Date of Signature

## **Appendix E**

TIC Form Is

1J - FORM I VOA-TIC  
 VOLATILE ORGANICS ANALYSIS DATA SHEET  
 TENTATIVELY IDENTIFIED COMPOUNDS

*Must  
 Done*

EPA SAMPLE NO.

C06X6

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036  
 Lab Code: A4 Case No.: 38651 Mod. Ref No.: \_\_\_\_\_ SDG No.: C06X4  
 Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0010483-03  
 Sample wt/vol: 5.00 (g/mL) mL Lab File ID: C8764.D  
 Level: (TRACE or LOW/MED) LOW Date Received: 06/16/2009  
 % Moisture: not dec. Date Analyzed: 06/20/2009  
 GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0  
 Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)  
 CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	UNKNOWN 6.39	4.72	46	J
02	UNKNOWN 6.39	5.25	47	J
03	UNKNOWN 6.39	7.34	47	J
04	UNKNOWN 6.39	7.39	48	J
05	UNKNOWN 6.39	7.55	54	J
06				
07				
08				
09				
10				
11				
12				
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17				
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19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
E966796 <sup>1</sup>	Total Alkanes	N/A		

<sup>1</sup>EPA-designated Registry Number.

000000042

*DJ*  
*7/18/09*

1J - FORM I VOA-TIC  
 VOLATILE ORGANICS ANALYSIS DATA SHEET  
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C06X8

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036  
 Lab Code: A4 Case No.: 38651 Mod. Ref No.: \_\_\_\_\_ SDG No.: C06X4  
 Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0010483-05  
 Sample wt/vol: 5.00 (g/mL) mL Lab File ID: C8766.D  
 Level: (TRACE or LOW/MED) LOW Date Received: 06/16/2009  
 % Moisture: not dec. Date Analyzed: 06/20/2009  
 GC Column: DB-624 ID: 0.20 (mm) Dilution Factor: 1.0  
 Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)  
 CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN 6.39	6.15	50	J
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796 <sup>1</sup>	Total Alkanes	N/A		

<sup>1</sup>EPA-designated Registry Number.

000000074

*JJ*  
*7/8/09*

1K - FORM I SV-TIC  
 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.  
 C06X4

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036  
 Lab Code: A4 Case No.: 38651 Mod. Ref No.: \_\_\_\_\_ SDG No.: C06X4  
 Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0010483-01  
 Sample wt/vol: 1000 (g/mL) mL Lab File ID: D1305.D  
 Level: (TRACE or LOW/MED) LOW Extraction: (Type) CONT  
 % Moisture: \_\_\_\_\_ Decanted: (Y/N) \_\_\_\_\_ Date Received: 06/16/2009  
 Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/16/2009  
 Injection Volume: 1.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/19/2009  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	000544-25-2	1,3,5-Cycloheptatriene	1.53	4.2	JN
02		UNKNOWN 3.65	1.58	5.6	J <i>LB</i>
03		UNKNOWN 3.65	1.72	13	J <i>LB</i>
04		UNKNOWN 3.65	1.78	6.0	J <i>LB</i>
05		UNKNOWN 3.65	1.81	8.9	J <i>LB</i>
06		UNKNOWN 3.65	1.88	2.6	J <i>LB</i>
07		UNKNOWN 3.65	1.96	8.3	J <i>LB</i>
08		UNKNOWN 3.65	2.73	2.2	J <i>LB</i>
09		UNKNOWN 3.65	2.98	3.8	J <i>LB</i>
10	000526-73-8	Benzene, 1,2,3-trimethyl-	3.49	2.1	JN
11		UNKNOWN 3.65	3.78	2.2	J
12		UNKNOWN 3.65	3.84	3.2	J <i>LB</i>
13	000095-13-6	Indene	4.00	2.1	JN
14		UNKNOWN 10.31	11.48	3.5	J
15		UNKNOWN 14.47	12.73	3.8	J <i>LB</i>
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796 <sup>2</sup>	Total Alkanes	N/A		

<sup>2</sup>EPA-designated Registry Number.

*DJ*  
*7/8/09*

1K - FORM I SV-TIC  
 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C06X5

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036  
 Lab Code: A4 Case No.: 38651 Mod. Ref No.: \_\_\_\_\_ SDG No.: C06X4  
 Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0010483-02  
 Sample wt/vol: 1000 (g/mL) mL Lab File ID: D1307.D  
 Level: (TRACE or LOW/MED) LOW Extraction: (Type) CONT  
 % Moisture: \_\_\_\_\_ Decanted: (Y/N) \_\_\_\_\_ Date Received: 06/16/2009  
 Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/16/2009  
 Injection Volume: 1.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/20/2009  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	UNKNOWN 3.65	1.58	4.3	J <del>18</del>
02	UNKNOWN 3.65	1.65	3.0	J <del>18</del>
03	UNKNOWN 3.65	1.72	12	J <del>18</del>
04	UNKNOWN 3.65	1.78	5.9	J <del>18</del>
05	UNKNOWN 3.65	1.81	8.9	J <del>18</del>
06	UNKNOWN 3.65	1.88	3.6	J <del>18</del>
07	UNKNOWN 3.65	1.96	7.5	J <del>18</del>
08	UNKNOWN 3.65	2.73	2.8	J <del>18</del>
09	007785-70-8 1R .alpha. Pinene	2.90	4.1	JN <del>18</del>
10	UNKNOWN 3.65	3.49	2.3	J
11	UNKNOWN	3.60	2.1	J <del>18</del>
12	UNKNOWN 3.65	3.84	3.2	J <del>18</del>
13	000766-97-2 Benzene, 1-ethynyl-4-methyl-	4.00	2.2	JN
14	002471-83-2 1H-Indene, 1-ethylidene-	6.59	2.2	JN
15	000057-10-3 n-Hexadecanoic acid	11.48	3.7	JN
16	000544-63-8 Tetradecanoic Acid	12.73	3.7	JN
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
	E966796 <sup>2</sup> Total Alkanes	N/A		

<sup>2</sup>EPA-designated Registry Number.

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7/8/09

000000320

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1K - FORM I SV-TIC  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C06X6

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036

Lab Code: A4 Case No.: 38651 Mod. Ref No.: \_\_\_\_\_ SDG No.: C06X4

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0010483-03

Sample wt/vol: 1000 (g/mL) mL Lab File ID: D1308.D

Level: (TRACE or LOW/MED) LOW Extraction: (Type) CONT

% Moisture: \_\_\_\_\_ Decanted: (Y/N) \_\_\_\_\_ Date Received: 06/16/2009

Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/16/2009

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/20/2009

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN 3.65	1.59	4.9	J
02		UNKNOWN 3.65	1.65	2.8	J
03		UNKNOWN 3.65	1.72	14	J
04		UNKNOWN 3.65	1.75	2.8	J
05		UNKNOWN 3.65	1.78	4.4	J
06		UNKNOWN 3.65	1.81	10	J
07		UNKNOWN 3.65	1.88	2.2	J
08		UNKNOWN 3.65	1.96	9.3	J
09		UNKNOWN 3.65	2.73	2.4	J
10	007785-70-8	1R-.alpha.-Pinene	2.90	4.4	JN
11		UNKNOWN	3.60	2.6	J
12		UNKNOWN 3.65	3.84	4.7	J
13		UNKNOWN 10.31	11.26	6.9	J
14	000057-10-3	n-Hexadecanoic acid	11.49	14	JN
15	000057-11-4	Octadecanoic acid	12.74	19	JN
16		UNKNOWN	16.00	4.3	J
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796 <sup>2</sup>	Total Alkanes	N/A	2.5	J

<sup>2</sup>EPA-designated Registry Number.

*J*  
*7/18/09*

000000355

1K - FORM I SV-TIC  
 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C06X8

Lab Name: A4 SCIENTIFIC, INC. Contract: EPW05036  
 Lab Code: A4 Case No.: 38651 Mod. Ref No.:          SDG No.: C06X4  
 Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0010483-05  
 Sample wt/vol: 1000 (g/mL) mL Lab File ID: D1314.D  
 Level: (TRACE or LOW/MED) LOW Extraction: (Type) CONT  
 % Moisture:          Decanted: (Y/N)          Date Received: 06/16/2009  
 Concentrated Extract Volume: 1000 (uL) Date Extracted: 06/16/2009  
 Injection Volume: 1.0 (uL) GPC Factor: 1.0 Date Analyzed: 06/20/2009  
 GPC Cleanup: (Y/N) N pH:          Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN 3.63	1.94	2.0	J
<del>02</del>	<del>000080 56 8</del>	<del>.alpha. Pinene</del>	<del>2.89</del>	<del>6.0</del>	<del>JN</del> <b>AB</b>
03		UNKNOWN 3.63	3.51	2.2	J
04		UNKNOWN 5.34	5.06	2.3	J
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796 <sup>2</sup>	Total Alkanes	N/A		

<sup>2</sup>EPA-designated Registry Number.

*DJ*  
*7/9/09*