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ANALYSIS: UDA METHOD NO.: 8260

ARDL Report(s) #: 006615 MATRIX: SEA CUCUMBER

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	By:	Date:
Package Preparation	JTA	04/07/14
Analytical Review	CS	4/08/14
Final Review	BAD	4/22/14
QA Review	ASD	4/23/14

Rev. 1.1

Organic Package Review Checklist

Rev. 1.1

ORGANIC PACKAGE REVIEW CHECKLIST

METHOD: 8260

	Initial	Date
Case Narrative and/or Nonconformance Reports		
Case Narrative / Analyst Comment Sheets	US	4/08/14
Nonconformance / Noncompliance Reports (if applicable)		
Sample Receipt Information		
Copies of Original Chain-of-Custody Forms	US	4/08/14
Cooler Receipt Form and Airbills		
Phone Messages (If applicable)		
Field Sample Results	US	4/08/14
QC Summary Forms		
Surrogate Summary, if applicable	US	4/08/14
Spike Blank and/or MS Summary		
Blank Results & Blank Summary, if applicable		
ISTD Area Summary, if applicable		
Sample Preparation Information (if applicable)		
Total Solids Determination (If applicable)	Na	
Extraction Log (If applicable)		
Extraction Notebook Pages (If applicable)		
Spiking Solutions Notebook Pages		
MS/MSD's		
Surrogate/ISTDs		
Spiking Solutions Certificates Of Analyses		
MS/MSD's		
Surrogates/ISTDs		
Certificates of Analysis (Vendor)		
Standard Preparation Information		
Instrument Logs/Analysis Notebook Pages	US	4/08/14
Certificates of Analysis (Vendor)		
Analytical Run Number 1		
Calibration Information	US	4/08/14
Tune Data		
Initial Calibration		
Continuing Calibration		
Instrument Logs/Analysis Notebook Pages		
Blank/Sample/Field QC Data		
Analytical Run Number 2 (if required)		
Calibration Information	Na	
Tune Data		
Initial Calibration		
Continuing Calibration		
Instrument Logs/Analysis Notebook Pages		
Blank/Sample/Field QC Data		

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ORGANIC PACKAGE REVIEW CHECKLIST (Continued)

METHOD: 8260

	Initial	Date
Analytical Run Number 3 (if required)		
Calibration Information	Na	
Tune Data		
Initial Calibration		
Continuing Calibration		
Instrument Logs/Analysis Notebook Pages		
Blank/Sample/Field QC Data		
Analytical Run Number 4 (if required)		
Calibration Information	Na	
Tune Data		
Initial Calibration		
Continuing Calibration		
Instrument Logs/Analysis Notebook Pages		
Blank/Sample/Field QC Data		
Analytical Run Number 5 (if required)		
Calibration Information	Na	
Tune Data		
Initial Calibration		
Continuing Calibration		
Instrument Logs/Analysis Notebook Pages		
Blank/Sample/Field QC Data		
Analytical Run Number 6 (if required)		
Calibration Information	Na	
Tune Data		
Initial Calibration		
Continuing Calibration		
Instrument Logs/Analysis Notebook Pages		
Blank/Sample/Field QC Data		
Example Calculation		
Example Calculation Sheet	LS	4/08/14
Miscellaneous Additional Data (if applicable)	LS	4/08/14

NA = Not Applicable

I have checked this package for completeness and verify the following:

1. Pencils, whiteout, whiteout tape, and dark highlighters were not used. ✓
2. All notebook pages are signed. ✓
3. All corrections contain the original data "struck through" with initials and date. ✓
4. All comments found throughout the data are defined as required. ✓
5. All pages are legible. ✓
6. Manual integrations, if applicable, are printed out and include an explanation with signature of the analyst and date. Na

Package Completeness Checked By/Date: LS 4/08/14

Rev. 1.1

Case Narrative and/or Nonconformance Reports

Rev. 1.1

ORGANIC ANALYSIS CASE NARRATIVE

Corps of Engineers – ERDC, Vicksburg **Date: 4/23/14**

ARDL Report No.: 6615 **Lab Name: ARDL, Inc.**

Project Name: MAKAU MILITARY RESERVATION OAHU (SEA CUCUMBER)

Samples Received at ARDL: 03/14/2014

Lab ID No.	Sample ID No.	Date Collected	Date Analyzed	Analysis Requested
006615-01	MAK111C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-02	MAK113C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-03	MAK114C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-04	MAK115C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-05	MAK116C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-06	MAK117C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-07	MAK118C	01/31/2014	03/18/2014	PURGEABLE ORGANICS
006615-08	MAK120C	02/11/2014	03/18/2014	PURGEABLE ORGANICS

PURGEABLE ORGANICS – METHOD 8260B

Eight (8) tissue (sea cucumber) samples were received by ARDL, Inc. on March 14, 2014, for 8260B analysis. Due to specific project requirements and the unusual nature of the samples, some changes to standard protocol were made. The requested analyte list was limited to ethylbenzene, m & p-xylene, o-xylene, toluene, styrene and 1,2,4-trimethylbenzene. Only the two internal standards used to quantitate these analytes and their associated surrogate compounds (toluene-d8 and 4-bromofluorobenzene) were evaluated in all calibrations and sample analyses. A nominal sample weight of 2 grams was chosen to avoid problems related to the sample matrix while achieving a reporting limit of 12.5 ug/Kg. Due to the tendency of these samples to foam during the purge step, a commercial anti-foam agent (RESTEK Cat. No. 31822) was added to all samples, blanks and LCS analyses. Previous project analyses also indicated a co-eluting interferent at o-xylene with a significant amount of M/Z 91, the standard quant ion for o-xylene. Therefore, initial and daily calibrations and all analyses used the secondary characteristic ion (M/Z 106) for o-xylene quantitation.

INITIAL CALIBRATION

The initial calibration was performed using eight calibration points. All calibration criteria were met.

CONTINUING CALIBRATION

The daily calibration standards passed criteria.

SURROGATES

All surrogate recoveries met a default range of 50 – 150%.

INTERNAL STANDARD

Internal standard responses were acceptable for all analyses.

LCS

The associated LCS analysis met the recovery criteria.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

An MS/MSD analysis was performed on sample MAK116C and met the recovery criteria.

ORGANIC ANALYSIS CASE NARRATIVE

Corps of Engineers – ERDC, Vicksburg **Date: 4/22/14**

ARDL Report No.: 6615 **Lab Name: ARDL, Inc.**

Project Name: MAKAU MILITARY RESERVATION OAHU (SEA CUCUMBER)

Samples Received at ARDL: 03/14/2014

METHOD BLANKS

No target analytes were detected in the method blank above the reporting limit.

ORGANIC DATA REPORTING QUALIFIERS

The following organic data reporting qualifiers are used as required.

ND- Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. This flag is used when estimating a concentration of a compound that meets identification criteria but the result is less than the quantitation or reporting limit but greater than the method detection limit.

P - This flag is used for any two column confirmation methodology when there is greater than 40% difference for detected concentrations between the two columns. The primary column value is reported on the Form 1 and flagged with a "P".

B - This flag is used when the analyte is found above the reporting limit in the blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

Sample Receipt Information

Rev. 1.1

Original in 4411
dlc
3-14-14

ARDL, Inc

P.O. Box 1566, 400 Aviation Drive, Mount Vernon, Illinois 62864
Phone (618) 244-3235, Fax (618) 244-1149

CHAIN OF CUSTODY RECORD

Project
ARDL / Makau Military Reservation Oahu, Hawaii Project

SAMPLERS (Signature)

SAMPLE NUMBER	DATE	TIME	Comp	Grab	# of Containers	Purgeable Organics 8260B	Explosives 8330	OCPs 8081	SVCOs 8270C	ARDL, Inc Remarks or Sample Location	PRESERVATION ICED	PRESERVATION Specify Chemicals added and final pH if known
MAK111C	1/31/2014	1000		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK113C	1/31/2014	1120		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK114C	1/31/2014	1155		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK115C	1/31/2014	1300		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK116C	1/31/2014	1330		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK117C	1/31/2014	1435		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK118C	1/31/2014	1605		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK120C	2/11/2014	1030		x	1	x	x	x	x	Mokuleia Site - Sea Cucumber	x	
MAK120L	1/31/2014	1040		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK121L	1/31/2014	1130		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK122L	1/31/2014	1405		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK123L	1/31/2014	1455		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK124L	1/31/2014	1540		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK126L	1/31/2014	1615		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK127L	2/11/2014	1304		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK128L	2/11/2014	1415		x	1	x	x	x	x	Mokuleia Site - Limu	x	
MAK116L	1/31/2014	820		x	1	x	x	x	x	Maena Point Site - Limu	x	
MAK117L	1/31/2014	835		x	1	x	x	x	x	Maena Point Site - Limu	x	
MAK118L	1/31/2014	910		x	1	x	x	x	x	Maena Point Site - Limu	x	

Relinquished by: (Signature)	Date	Time	Relinquished by: (Signature)
	3/13/14	1600	
Relinquished by: (Signature)	Date	Time	Relinquished by: (Signature)
Received for Laboratory by: (Signature)	Date	Time	Shipping Ticket No.
	3/14/14	0915	

REMARKS / SPECIAL INSTRUCTIONS:

Project Samples. Please treat each matrix separately.

Please send level 4 hardcopy report and excel edd to: Dean Dickerson, c/o ARDL, Inc. 400 Aviation Drive, Mount Vernon, IL 62864. Email questons to ddickerson@ardlinc.com.

COOLER RECEIPT REPORT
ARDL, INC.

Original in 6617 dlc 3-14-14

ARDL #: 6615-6617

Cooler # 6 6 0

Number of Coolers in Shipment: 1

Project: MAKAU MILITARY RESERVATION OAHU

Date Received: 3-14-14

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 3-14-14 (Signature) L D Cochrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... (YES) NO

   If YES, enter carrier name and airbill number here: fed-ex 9325 1888 1273

2. Were custody seals on outside of cooler? ..... YES NO N/A

   How many and where? 1 (front), Seal Date: 3-13-14, Seal Name: ? Can't read

3. Were custody seals unbroken and intact at the date and time of arrival? ..... (YES) NO
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag ~~and taped inside to the lid~~? dlc 3/14/14 ..... (YES) NO
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO ✓ Cooler Temp. 1.4 C

B. **LOG-IN PHASE:** Date samples were logged-in: 3-14-14 (Signature) L D Cochrum

10. Describe type of packing in cooler: bubble pack / bubble bags
11. Were all bottles sealed in separate plastic bags? not sealed ..... YES NO N/A
12. Did all bottles arrive unbroken and were labels in good condition? ..... YES (NO)
13. Were bottle labels complete? ..... (YES) NO
14. Did all bottle labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... YES NO (N/A)
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... (YES) NO N/A

Comments and/or Corrective Action:
12) MAK 114C - lid broken / seal intact
MAK 127L - lid broken / seal not intact.
MAK 116L - lid broken / seal intact
MAK 117C - lid broken / seal intact
MAK 122L - lid broken / seal intact
(By: Signature) dlc Date: 3-14-14

Sample Transfer	
Fraction: All	Fraction:
Area #: freezer	Area #:
By: dlc	By:
On: 3-14-14	On:

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 05/07/07

Original in 6617
dlc
3-14-14

ORIGIN ID:GRBA (920) 469-2436
SHIPPING
PACE ANALYTICAL
1241 BELLEVUE

GREEN BAY, WI 54302
UNITED STATES US

SHIP DATE: 13MAR14
ACTWGT: 42.0 LB MAN
CAD: 255289/CAFE2704

DRY ICE: 2.3 KGS
BILL THIRD PARTY

TO DONNA COCKRUM
ARDL
400 AVIATION DRIVE
P.O BOX 1566
MOUNT VERNON IL 62864
(618) 244-3235
INV:
PO:
REF:
DEPT:

51BCL/CC4F/6F03

FedEx
Express

J131113052301 26

FRI - 14 MAR AA
STANDARD OVERNIGHT

TRK# 0201 9325 1888 1273

ICE
62864
STL
IL-US

NA MVNA

Part # 156148-434 RIT2 03/12

Field Sample Results

Rev. 1.1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 111C	ARDL Lab No.:	006615-01
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318407
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1000	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	99%
4-Bromofluorobenzene	50-150	92%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-01, VOLATILES, GC/MS (8260) Page 1 of 1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 113C	ARDL Lab No.:	006615-02
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318408
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1120	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	98%
4-Bromofluorobenzene	50-150	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-02, VOLATILES, GC/MS (8260) Page 1 of 1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 114C	ARDL Lab No.:	006615-03
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318409
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1155	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	97%
4-Bromofluorobenzene	50-150	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 115C	ARDL Lab No.:	006615-04
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318410
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1300	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	100%
4-Bromofluorobenzene	50-150	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-04, VOLATILES, GC/MS (8260) Page 1 of 1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 116C	ARDL Lab No.:	006615-05
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318411
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1330	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	99%
4-Bromofluorobenzene	50-150	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-05, VOLATILES, GC/MS (8260) Page 1 of 1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 117C	ARDL Lab No.:	006615-06
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318412
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1435	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	99%
4-Bromofluorobenzene	50-150	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-06, VOLATILES, GC/MS (8260) Page 1 of 1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 118C	ARDL Lab No.:	006615-07
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318413
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1605	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	94%
4-Bromofluorobenzene	50-150	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-07, VOLATILES, GC/MS (8260) Page 1 of 1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 120C	ARDL Lab No.:	006615-08
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318414
Sample Date:	02/11/2014	Received Date:	03/14/2014
Sample Time:	1030	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	101%
4-Bromofluorobenzene	50-150	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-08, VOLATILES, GC/MS (8260) Page 1 of 1

QC Summary Forms

Surrogate Summary, if applicable

Spike Blank and/or MS Summary

Blank Results & Blank Summary, if applicable

ISTD Area Summary, if applicable

Rev. 1.1

2B
SEA CUC VOLATILE SURROGATE RECOVERY

Lab Name: ARDL, INC. Contract: ---

Lab Code: --- Case No.: 006615 SAS No.: --- SDG No.: ---

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 ( ) #	S4 ( ) #			TOT OUT
01	SPBK 03/18/14	102	98					0
02	BLANK 03/18/14	103	102					0
03	MAK111C	99	92					0
04	MAK113C	98	98					0
05	MAK114C	97	97					0
06	MAK115C	100	95					0
07	MAK116C	99	98					0
08	MAK117C	99	104					0
09	MAK118C	94	95					0
10	MAK120C	101	105					0
11	MAK116CMS	96	96					0
12	MAK116CMSD	106	102					0
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		QC LIMITS	MATRIX LIMITS
S1	Toluene-d8	(50 - 150)	(50 - 150)
S2	4-Bromofluorobenzene	(50 - 150)	(50 - 150)
S3		(-)	(-)
S4		(-)	(-)

column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

BLANK SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 006615 Report Date: 04/03/2014

Project Name: MAKAU MILITARY RES O Analysis: VOLATILES, GC/MS (8260) Analytical Method: 8260B
Project No.: Prep Method: 5030A

Matrix: QC Material QC Batch: 0321JFSM Prep. Date: 03/18/2014
Amount Used: 2 g Level: LOW Analysis Date: 03/18/2014

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Toluene	89.4	100	89	--	--	--	85-118	--	--
Ethyl Benzene	85.6	100	86	--	--	--	86-119	--	--
m & p-Xylene	171	200	86	--	--	--	81-121	--	--
Styrene	85.2	100	85	--	--	--	84-119	--	--
o-Xylene	87.4	100	87	--	--	--	81-121	--	--
1,2,4-Trimethylbenzene	91.9	100	92	--	--	--	83-119	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Toluene-d8	102	--	50-150
4-Bromofluorobenzene	97.8	--	50-150

'*' indicates a recovery outside of standard limits.
Spike Blanks for 006615-05, VOLATILES, GC/MS (8260)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260) Analytical Method: 8260B
Project No.: Prep Method: 5030A

Field ID:	MAK 116C	Prep. Date:	03/18/2014	ARDL Lab No.:	006615-05
Desc/Location:	MAKAU MILITARY RESERVATIO	Amount Used:	2 g	Lab Filename:	
Sample Date:	01/31/2014	% Moisture:	No Moisture Present	Received Date:	03/14/2014
Sample Time:	1330	QC Batch:	0321JFSM	Analysis Date:	03/18/2014
Matrix:	TISSUE	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Toluene	ND	98.2	100	98.2	106	100	106.2	81-126	7.8	25
Ethyl Benzene	ND	95.5	100	95.5	103	100	103.3	82-130	7.9	25
m & p-Xylene	ND	191	200	95.6	205	200	102.7	84-129	7.2	25
Styrene	ND	101	100	100.8	107	100	107	79-127	6	25
o-Xylene	ND	99.2	100	99.2	107	100	107.1	81-128	7.7	25
1,2,4-Trimethylbenzene	ND	101	100	101	106	100	105.8	80-124	4.6	25

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Toluene-d8	96	106	50-150
4-Bromofluorobenzene	96	102	50-150

'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 006615-05, VOLATILES, GC/MS (8260)

4B

VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

BLANK 03/18/14

Lab Name: ARDL, INC. Contract: ---

Lab Code: --- Case No.: 006615 SAS No.: --- SDG No.: ---

Lab File ID: A0318406 Lab Sample ID: 006615-05B1

Date Analyzed: 03/18/14 Time Analyzed: 11:23

GC Column: RTX-VMS ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: AG1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	MAK111C	006615-01	A0318407	12:01
02	MAK113C	006615-02	A0318408	12:28
03	MAK114C	006615-03	A0318409	12:56
04	MAK115C	006615-04	A0318410	13:24
05	MAK116C	006615-05	A0318411	13:51
06	MAK117C	006615-06	A0318412	14:29
07	MAK118C	006615-07	A0318413	14:59
08	MAK120C	006615-08	A0318414	15:28
09	MAK116CMS	006615-05MS	A0318415	15:58
10	MAK116CMSD	006615-05MD	A0318416	16:27
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
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24				
25				
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27				
28				
29				
30				

COMMENTS:

METHOD BLANK REPORT
ARDL, Inc. 400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	NA	ARDL Lab No.:	006615-05B1
Desc/Location:	NA	Lab Filename:	A0318406
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	03/18/2014
Matrix:	QC Material	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units
Toluene	2.50	12.5	ND		UG/KG
Ethyl Benzene	2.50	12.5	ND		UG/KG
m & p-Xylene	5.00	25.0	ND		UG/KG
Styrene	2.50	12.5	ND		UG/KG
o-Xylene	2.50	12.5	ND		UG/KG
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	103%
4-Bromofluorobenzene	50-150	102%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Blank for Run 0321JFSM, VOLATILES, GC/MS (8260)

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ARDL, Inc. Contract: ---

Lab Code: --- Case No.: 006615 SAS No.: --- SDG No.: ---

Lab File ID (Standard): A0212416 Date Analyzed: 02/12/14

Instrument ID: AG1 Time Analyzed: 18:32

Matrix: (soil/water) SEA CUC Level: (low/med) Low Column: (pack/cap) CAP

		IS1(CBZ) AREA #	RT #	IS2(DCB) AREA #	RT #	IS3( ) AREA #	RT #
	12 HOUR STANDARD	279384	8.76	268227	10.14		
	UPPER LIMIT	558768	9.26	536454	10.64		
	LOWER LIMIT	139692	8.26	134114	9.64		
	EPA SAMPLE NO.						
1	SPBK 03/18/14	317981	8.77	309346	10.14		
2	BLANK 03/18/14	301422	8.77	301153	10.14		
3	MAK111C	315050	8.77	349959	10.14		
4	MAK113C	301008	8.77	312715	10.14		
5	MAK114C	296444	8.77	322280	10.14		
6	MAK115C	281950	8.77	320073	10.14		
7	MAK116C	276589	8.77	301387	10.14		
8	MAK117C	275219	8.76	284160	10.14		
9	MAK118C	267645	8.76	282113	10.14		
10	MAK120C	259839	8.76	269310	10.14		
11	MAK116CMS	260269	8.76	271420	10.14		
12	MAK116CMSD	258983	8.76	275578	10.14		
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (CBZ) = Chlorobenzene-d5
IS2 (DCB) = 1,4-Dichlorobenzene-d4
IS3 ( ) =

UPPER LIMIT = +100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk
* Values outside of QC limits

Sample Preparation Information

(Not Applicable for VOA Purge and Trap Method)

Rev. 1.1

Standards Preparation Information

Rev. 1.1

X1004 Gases - Ultra

DWM-544-1
Lot: CJ-2970
Exp: 08/31/2015
ULTRA 1 mL
VOC Gas Mixture
6 analyte(s) at 2000 µg/mL in methanol R4318
250 Smith St, No Kingstown, RI 02852 USA
For Laboratory Use Only
US 1/29/14

100 ml

3900 ml MeOH (R4474)
4000 ml 50 ug/ml US 1/29/14 Exp. 7/05/14

X1005 Acetone (only) STD

90 µL of ReTek Acetone (5000 ppm) 30275 Lot A088080 exp 07/2015
1710 µL of MeOH R4474

1,800 µL of 250 µg/mL
GM 1/30/14 Exp. 2/6/14

X1006 Ketones (Absolute)

150 µL Abs Ketones (2,000 ppm) Cat 82402, Lot 070313 Xp 07/2016
1050 µL MeOH

1,200 µL of 250 µg/mL GM 1/30/14

X1007 BFB

50 ml STS-110N-1 lot CH-3248 2000 ug/ml (R4540) exp. 11/30/15
3950 ml MeOH (R4479)
4000 ml 25 ug/ml US 2/04/14 Exp. 8/04/14

US 2/04/14

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
US	2/04/14	DRC	2/5/14

X1021 524.2 IC MIX

43 ml 8260 Mix (W) DWM-589N-1 lot CK-2561 2000 ug/ml (R4501) exp. 9/30/16
86 ml Hexachloroethane (Abs) 70199 lot 058212 1000 ug/ml (R4497) exp. 5/22/17
17.2 ml DBCP (W) EPA-1021 lot CH-1351 5000 ug/ml (R4376) exp. 5/31/15
43 ml CS_2 (Acc) APP-9-035-20X lot 212071234 2.0 mg/ml (R4438) exp. 7/18/22
3810 ml MeOH (R4479)
4000 ml DBCP = 43 ug/ml
Other = 21.5 ug/ml LS 2/07/14 Exp. 2/14/14

X1022 Ketones - (Abs) 215 ug/ml

215 ml 82402 lot 070313 2000 ug/ml (R4512) exp. 7/03/16
1785 ml MeOH (R4479)
2000 ml 215 ug/ml LS 2/07/14 Exp. 2/14/14

X1023 ISTD - mix

STM-520-1
Lot: CH-3660
Exp: 12/31/2014
ULTRA 1 mL
Internal Standard Mixture
R4399 analyte(s) at 2500 µg/mL in methanol
250 Smith St, No Kingstown, RI 02852 USA
For Laboratory Use Only
LS 2/12/14

80 ml

3920 ml MeOH (R4479)
4000 ml 50 ug/ml LS 2/12/14 Exp. 2/19/14

X1024 Sur - mix

STM-530-1
Lot: CJ-1280
Exp: 05/31/2015
ULTRA 1 mL
Method 8260 Surrogate Standard Mixture
R4397 analyte(s) at 2500 µg/mL in methanol
250 Smith St, No Kingstown, RI 02852 USA
For Laboratory Use Only
LS 2/12/14

80 ml

3920 ml MeOH (R4479)
4000 ml 50 ug/ml LS 2/12/14 Exp. 2/19/14

Continued on Page

Read and Understood By

LS	2/12/14	TRC	2/13/14
Signed	Date	Signed	Date

X1025 IC MIX

8260 Mix (U)	MTBE (U)	RMA (CS)	Ketones (RES)	CS2 (ABS)		MEOH	Final Vol. (uL)
DWM-589N Lot CK-2561 2000 ug/mL R4502 Exp.09/30/16	STS-440-1 Lot CG-4444 2000 ug/mL R4230 Exp. 01/31/15	SP-1022-345DSZ Lot 2246900 Varied Conc. R4649 Exp. 12/31/14	30006 Lot A090981 5000 ug/mL R4531 Exp. 12/2015	70060 Lot 121813 1000 ug/mL R4661 Exp. 12/18/16		R4479	
200	200	400	160	400		2640	4000

Ketones = 200 ug/mL
Acrylo/m&p-Xylenes = 200ug/mL
All other = 100ug/ml

Prep: 02/12/14

Exp: 02/19/14

LS 2/12/14

X1026 Gases - Abs

100 ml 30058 lot 010213 2000 ug/mL (R4445) exp. 01/02/16
3900 ml MeoH (R4479)
4000 ml 50 ug/ml LS 2/12/14 Exp. 2/19/14

X1027 ICV MIX

8260 Mix (ABS)	MTBE (S)	RMA (ACC)	Ketones (ABS)	CS2 (ACC)	MEOH	Final Vol. (uL)
32001 Lot 022613 2000 ug/mL R4449 Exp.02/26/16	CRM48483 Lot LB94566 2000 ug/mL R4517 Exp. 07/2015	S-2932-R1 Lot 212081711 Varied Conc. R4413 Exp. 9/04/14	82402 Lot 070313 2000 ug/mL R4511 Exp. 07/03/16	APP-9-035-20X Lot 212071234 2.0 mg/mL R4438 Exp. 07/18/22	R4479	
25	25	250	50	25	1625	2000

Ketones/Acrylo/
m&p-Xylenes/DBCP = 50 ug/mL
OTHER = 25 ug/mL

Prep: 02/13/14

EXP: 02/20/14

LS 2/13/14

X1028 Gases - Ultra

100 ml DWM-544 lot CJ-44669 2000 ug/ml (R4367) exp. 1/31/16
3900 ml MeoH (R4479)
4000 ml 50 ug/ml LS 2/13/14 Exp. 2/20/14

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
LS	2/13/14	TRC	2/17/14

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Rec'd 12/05/13

4-Bromofluorobenzene Solution

Product Number:	STS-110N			**Page:**	1 of 1
Lot Number:	CH-3248	**Lot Issue Date:**	07-Oct-2011	**Expiration Date:**	30-Nov-2015

This Certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
4-bromofluorobenzene	000460-00-4	RM03365	2005 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store at < 4° C

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

ACCREDITED
ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
wwww.ultrasci.com

William J. Leary
Quality Assurance Manager

Certificate of Analysis

Rec'd 1/11/13

ULTRA SCIENTIFIC
Analytical Solutions

Internal Standard Mixture

Product Number: STM-520

Page: 1 of 1

Lot Number: CH-3660 **Lot Issue Date:** 15-Nov-2011 **Expiration Date:** 31-Dec-2014

This Certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
chlorobenzene-d5	003114-55-4	RM01430-01	2503 ± 13 µg/mL
1,4-dichlorobenzene-d4	003855-82-1	RM01700-06	2500 ± 13 µg/mL
fluorobenzene	000462-06-6	RM03366-01	2513 ± 13 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store at < 4° C

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

A2LA ACCREDITED
ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
wwww.ultrascl.com

William J. Leary
Quality Assurance Manager

Rec'd 9/18/12

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Method 8260 Surrogate Standard Mixture

Product Number: STM-530 **Page:** 1 of 1

Lot Number: CJ-1280 **Lot Issue Date:** 17-Apr-2012 **Expiration Date:** 31-May-2015

This certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
4-bromofluorobenzene	000460-00-4	RM03908-	2512 ± 13 µg/mL
dibromofluoromethane	001868-53-7	RM04871-01	2512 ± 13 µg/mL
1,2-dichloroethane-d4	017060-07-0	RM04304-	2512 ± 13 µg/mL
toluene-d8	002037-26-5	RM04138-	2512 ± 13 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store at < 4° C

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

A2LA ACCREDITED
ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
wwww.ultrascl.com

William J. Leary
Quality Assurance Manager

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Rec'd 8/30/13

VOC Mixture

Product Number: DWM-589N

Page: 1 of 3

Lot Number: CK-2561 **Lot Issue Date:** 06-Aug-2013 **Expiration Date:** 30-Sep-2016

This certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
bromochloromethane	000074-97-5	RM00009	2004 ± 10 µg/mL
bromodichloromethane	000075-27-4	RM06861	2008 ± 10 µg/mL
bromoform	000075-25-2	RM00350	2007 ± 10 µg/mL
carbon tetrachloride	000056-23-5	RM00012	2009 ± 10 µg/mL
chloroform	000067-66-3	RM06503	2009 ± 10 µg/mL
dibromochloromethane	000124-48-1	RM04264	2009 ± 10 µg/mL
dibromomethane	000074-95-3	RM02090	2010 ± 10 µg/mL
methylene chloride	000075-09-2	RM06447	1998 ± 10 µg/mL
1,2-dibromoethane	000106-93-4	RM00018	2008 ± 10 µg/mL
1,1-dichloroethane	000075-34-3	RM00019	2006 ± 10 µg/mL
1,2-dichloroethane	000107-06-2	RM04655	2005 ± 10 µg/mL
1,1-dichloroethene	000075-35-4	RM01356	2008 ± 10 µg/mL
cis-1,2-dichloroethene	000156-59-2	RM05327	2005 ± 10 µg/mL
trans-1,2-dichloroethene	000156-60-5	RM00490	2010 ± 10 µg/mL
1,1,1,2-tetrachloroethane	000630-20-6	RM00024	2009 ± 10 µg/mL
1,1,2,2-tetrachloroethane	000079-34-5	RM02540	2009 ± 10 µg/mL
tetrachloroethene	000127-18-4	RM00026	2008 ± 10 µg/mL
1,1,1-trichloroethane	000071-55-6	RM00027	2009 ± 10 µg/mL
1,1,2-trichloroethane	000079-00-5	RM02575	2010 ± 10 µg/mL
trichloroethene	000079-01-6	RM06644	2007 ± 10 µg/mL

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 401-295-2330
www.ultrasci.com

William J. Leahy
Quality Assurance Manager

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

VOC Mixture

Product Number: DWM-589N

Page: 2 of 3

Lot Number: CK-2561

Lot Issue Date: 06-Aug-2013

Expiration Date: 30-Sep-2016

Analyte	CAS#	Analyte Lot	True Value
1,2-dibromo-3-chloropropane	000096-12-8	RM03703	2006 ± 10 µg/mL
1,2-dichloropropane	000078-87-5	RM02091	2005 ± 10 µg/mL
1,3-dichloropropane	000142-28-9	RM02080	2006 ± 10 µg/mL
2,2-dichloropropane	000594-20-7	RM04312	2005 ± 10 µg/mL
1,1-dichloropropene	000563-58-6	RM01234	2003 ± 10 µg/mL
cis-1,3-dichloropropene	010061-01-5	RM01442	2003 ± 10 µg/mL
trans-1,3-dichloropropene	010061-02-6	RM01443	2005 ± 10 µg/mL
hexachlorobutadiene	000087-68-3	RM00438	2006 ± 10 µg/mL
1,2,3-trichloropropane	000096-18-4	RM02562	2008 ± 10 µg/mL
benzene	000071-43-2	RM03830	2005 ± 10 µg/mL
n-butylbenzene	000104-51-8	RM03651	2000 ± 10 µg/mL
sec-butylbenzene	000135-98-8	RM01800	2003 ± 10 µg/mL
tert-butylbenzene	000098-06-6	RM00043	2009 ± 10 µg/mL
ethylbenzene	000100-41-4	RM00783	2004 ± 10 µg/mL
isopropylbenzene	000098-82-8	RM00835	2009 ± 10 µg/mL
4-isopropyltoluene	000099-87-6	RM00046	2001 ± 10 µg/mL
naphthalene	000091-20-3	RM02406	2005 ± 10 µg/mL
n-propylbenzene	000103-65-1	RM02468	2008 ± 10 µg/mL
styrene	000100-42-5	RM04479	2002 ± 10 µg/mL
toluene	000108-88-3	RM02555	2009 ± 10 µg/mL
1,2,4-trimethylbenzene	000095-63-6	RM00050	2004 ± 10 µg/mL
1,3,5-trimethylbenzene	000108-67-8	RM02565	2010 ± 10 µg/mL
o-xylene	000095-47-6	RM00052	2002 ± 10 µg/mL
m-xylene	000108-38-3	RM00053	2002 ± 10 µg/mL

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

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ISO 9001
Registered
TUV USA, Inc.
Cert. No. 09-1009

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William J. Leary
Quality Assurance Manager

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

VOC Mixture

Product Number: DWM-589N

Page: 3 of 3

Lot Number: CK-2561

Lot Issue Date: 06-Aug-2013

Expiration Date: 30-Sep-2016

Analyte	CAS#	Analyte Lot	True Value
p-xylene	000106-42-3	RM02647	2006 ± 10 µg/mL
bromobenzene	000108-86-1	RM00056	2008 ± 10 µg/mL
chlorobenzene	000108-90-7	RM01874	2008 ± 10 µg/mL
2-chlorotoluene	000095-49-8	RM03906	2010 ± 10 µg/mL
4-chlorotoluene	000106-43-4	RM01866	2009 ± 10 µg/mL
1,2-dichlorobenzene	000095-50-1	NT00355	2004 ± 10 µg/mL
1,3-dichlorobenzene	000541-73-1	NT00356	2003 ± 10 µg/mL
1,4-dichlorobenzene	000106-46-7	RM04303	2008 ± 10 µg/mL
1,2,3-trichlorobenzene	000087-61-6	RM02563	2009 ± 10 µg/mL
1,2,4-trichlorobenzene	000120-82-1	RM00063	2008 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store at < 4° C

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

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A2LA
Cert. No. 0851-01

ISO 9001
Registered
TUV USA, Inc.
Cert. No. 09-1009

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www.ultrasci.com

William J. Leary
Quality Assurance Manager

Rec'd 9/18/12

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Methyl tert-Butyl Ether Solution

Product Number: STS-440 **Page:** 1 of 1

Lot Number: CG-4444 **Lot Issue Date:** 03-Jan-2011 **Expiration Date:** 31-Jan-2015

This Certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
tert-butylmethyl ether	001634-04-4	46160	2007 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store at < 4° C

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

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ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

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401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Rec'd 12/16/13

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1-800-452-9994 • 1-610-692-3026 • Fax 1-610-692-8729
info@chemservice.com • www.chemservice.com

CERTIFICATE OF ANALYSIS

Mixture of 3 analytes

CONCENTRATION	Varied concentration in Methanol
CATALOG NUMBER	SP-1022345DSZ-1ML
LOT NUMBER	2246900
DATE CERTIFIED	12/10/13
EXPIRATION DATE	12/31/14
STORAGE	Room Temperature
HANDLING	See MSDS
INTENDED USE	For Laboratory Use Only

ID	Analyte	CAS	Weight Analyte (mg)	Lot	Purity	Certified Concentration (ug/mL)
N-11686	Dicyclopentadiene	77-73-6	25.600	00011137	99.00	1013.8
N-15088	Bicyclo[2,2,1]hepta-2,5-diene	121-46-0	25.400	396800	99.50	1010.9
N-11034	Acrylonitrile	107-13-1	51.100	00008601	99.50	2033.8

Analytical Test	Value
CONCENTRATION (GC/FID)	VERIFIED

Instructions for Use:
Shake mixture prior to use. If particles are present, sonicate for homogeneity. If sample is diluted to lower concentrations, Class A volumetric glassware must be used.
Minimum Sample Size- 0.2 uL for Direct Injection.
Chem Service Inc. guarantees the expanded uncertainty of the above analytes to be +/- 2.0% of the certified concentrations based on gravimetric preparation. The test results published in this report were obtained using equipment capable of producing results that are traceable to NIST and through NIST to the International System of Units (SI). The reported expanded uncertainty of measurement is stated as the combined standard uncertainty of measurement multiplied by the coverage factor k (k=2) such that the coverage probability corresponds to approximately 95%. For certified reference materials, homogeneity and thermal stability testing are available upon request.

Certified By:

Mary Beth O'Donnell

Mary Beth O'Donnell
CSM/TC

COA Form
Revision 1 (01/2013)

ISO 9001
Certificate Number:31610

ISO/IEC 17025
Accreditation Number:63520

Reference Material Producer
ISO GUIDE 34
Accreditation Number:63520

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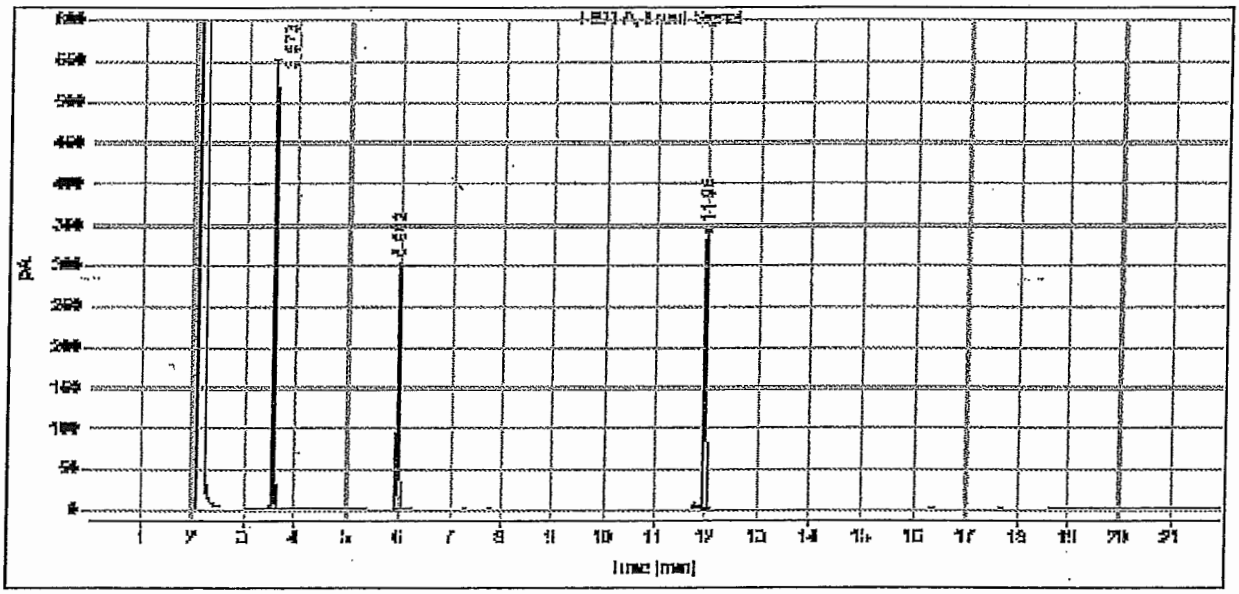
info@chemservice.com • www.chemservice.com

CERTIFICATE OF ANALYSIS

Gas Chromatography / Flame Ionization Detector (GC/FID)

Data file:	C:\CHEM32\1\DATA\1213\SG100443.D		
Sample name:	SP-1022450SZ		
Instrument:	GC 1	Sample type:	Sample
Injection date:	12/10/2013 9:02:35 AM	Location:	Vial 1
Acq. method:	MIX1.M	Injection volume:	1.0uL
Column name:	DB-624 (30m x 0.53mm x 3.0um)		



Signal: FID1 A, Front Signal

RT [min]	Type	Width [min]	Area	Height	Area%
3.573	BB	0.0388	1294.2858	543.3721	37.2976
5.982	BB	0.0247	1025.1239	293.9188	29.5412
11.950	BB	0.0531	1150.7445	334.8539	33.1612
		Sum	3470.1542		

ISO 9001 Certificate Number:31610 | ISO/IEC 17025 Accreditation Number:63520 | ISO GUIDE 34 Accreditation Number:63520

Rec'd 8/29/13

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Bellefonte, PA 16823-8812
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ISO Guide 34 Accredited Reference Material Producer Certificate #3222.01

ilac-MRA

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ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

Certificate of Analysis

FOR LABORATORY USE ONLY-READ MSDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 30006 **Lot No.:** A090981

Description : VOA Calibration Mix #1

Calibration Std #1 ketones 5000µg/mL, P&T Methanol/Water(90:10), 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : December 2015 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Acetone	5,000.0 µg/mL	+/- 29.0704	µg/mL	Gravimetric
	CAS # 67-64-1		+/- 399.3449	µg/mL	Unstressed
	Purity 99%		+/- 399.5405	µg/mL	Stressed
2	2-Butanone (MEK)	5,000.0 µg/mL	+/- 29.0704	µg/mL	Gravimetric
	CAS # 78-93-3		+/- 399.3449	µg/mL	Unstressed
	Purity 99%		+/- 399.5405	µg/mL	Stressed
3	4-Methyl-2-pentanone (MIBK)	5,000.0 µg/mL	+/- 29.0704	µg/mL	Gravimetric
	CAS # 108-10-1		+/- 399.3449	µg/mL	Unstressed
	Purity 99%		+/- 399.5405	µg/mL	Stressed
4	2-Hexanone	5,000.0 µg/mL	+/- 29.0704	µg/mL	Gravimetric
	CAS # 591-78-6		+/- 399.3449	µg/mL	Unstressed
	Purity ----%		+/- 399.5405	µg/mL	Stressed

Solvent: P&T Methanol/Water (90:10)
CAS # 67-56-1/7732-18-5
Purity 99%

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Certified Reference Material CRM

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CERTIFIED WEIGHT REPORT

			Lot #	
Part Number:	70060	**Solvent(s):**	DG596	Methanol
Lot Number:	121813			
Description:	Carbon disulphide			
Expiration Date:	121816			
Recommended Storage:	Refrigerate (4 °C)			
Nominal Concentration (µg/mL):	1000			

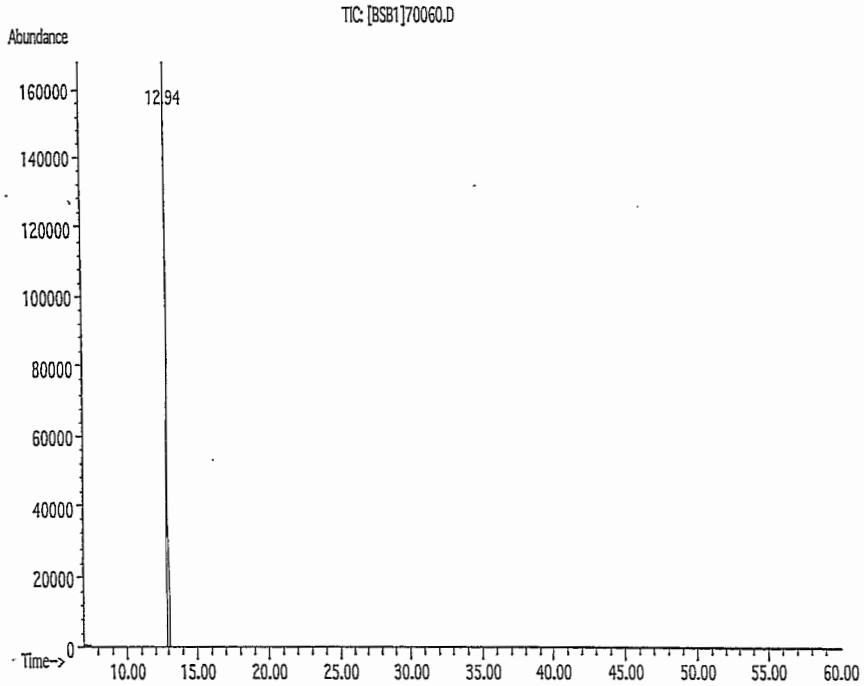
Formulated By: Paul Barron		121813 DATE
Reviewed By: Pedro L. Rentas		121813 DATE

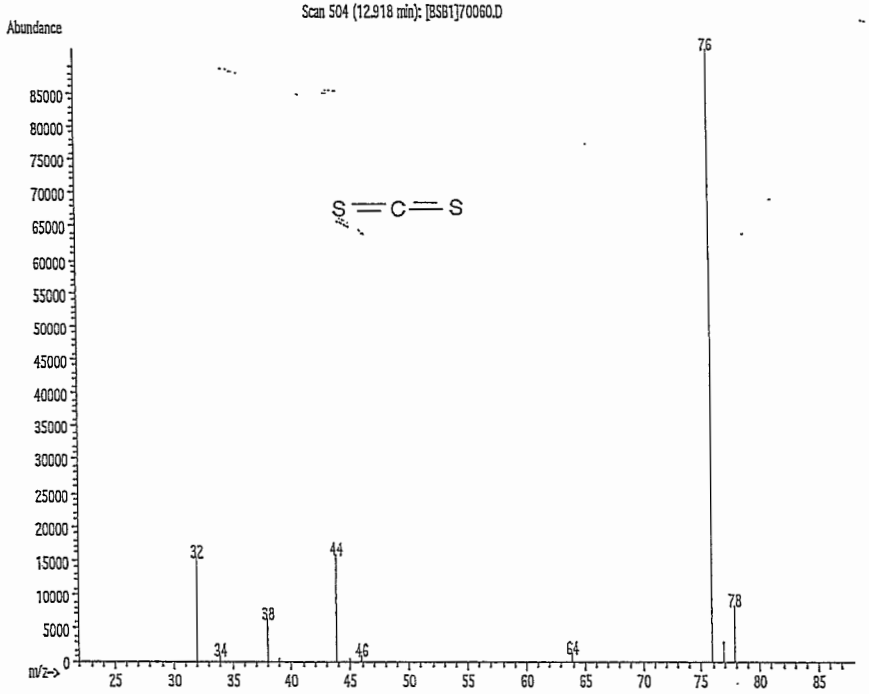
5E-05 Balance Uncertainty

Weight(s) shown below were combined and diluted to: 200.0 0.015 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty	CAS#	MSDS Information (Solvent Safety Info. On Attached pg.) OSHA PEL (TWA)	LD50
1. Carbon disulphide	60	PO 12273PO	1000	99	0.2	0.20203	0.20225	1001.1	0.0041	00075-15-0	4 ppm (12mg/m3) (skin)	orl-rat 1200mg/kg

Method GC6MSD-1: Column: (Vocol 60m X 0.25mm ID X 1.5µm film thickness). Temp. 1 = 35°C (10min.), Temp. 2 = 200°C (8.75 min.), Rate = 4°C/min., Injector Temp.= 200°C, Detector Temp. = 220°C. Analysis performed by Candice Warren.





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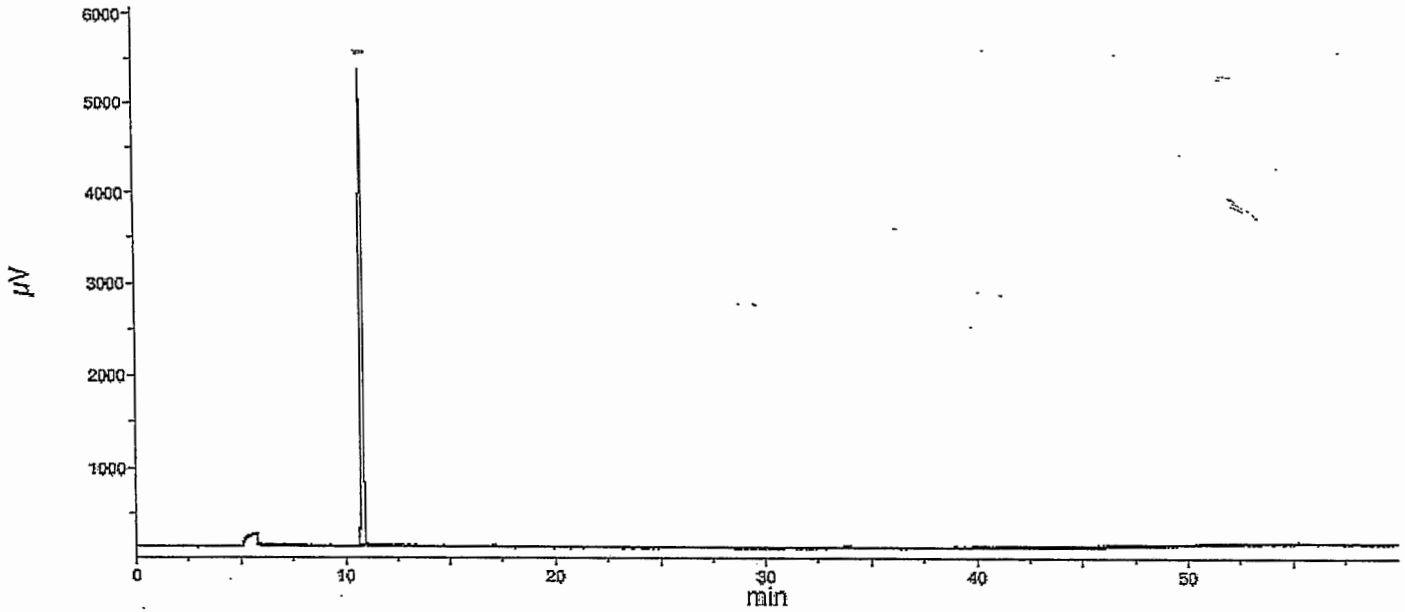
Run 34, "P70060 L121813 [1000µg/mL in MeOH]"

Run Length: 59.99 min, 35997 points at 10 points/second.
Created: Sat, Dec 28, 2013 at 1:37:07 AM.
Sampled: Sequence "122613-GC1", Method "GC1-M7".
Analyzed using Method "GC1-M7".

Analyte	PID RT (min.)
Carbon disulphide	10.81

Comments
GC1-M7 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 10 min.), Temp 2 = 200°C (Time 2 = 8.75 min.),
Rate = 4°C/min., Total run time = 60 min. Injector temp. = 200°C, PID Temp. = 200°C.
ELCD Signal = Edaq Channel 1 PID Signal = Edaq Channel 2
Standard injection = 0.5µL, Range=4 Purge Valve = 8 min



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CERTIFIED WEIGHT REPORT

Part Number:	30058	**Solvent(s):**	Lot # DE997	Methanol
Lot Number:	010213			
Description:	EPA Method 502/524 - Volatile Gases Mix #1			
	6 components			
Expiration Date:	010216			
Recommended Storage:	Freezer (0 °C)			
Nominal Concentration (µg/mL):	2000			

Weight(s) shown below were combined and diluted to: 499.9 0.058 Flask Uncertainty; 5E-05 Balance Uncertainty

Formulated By:	Vincent K. Criscio, Jr.	010213 DATE
Reviewed By:	Pedro L. Rentas	010213 DATE

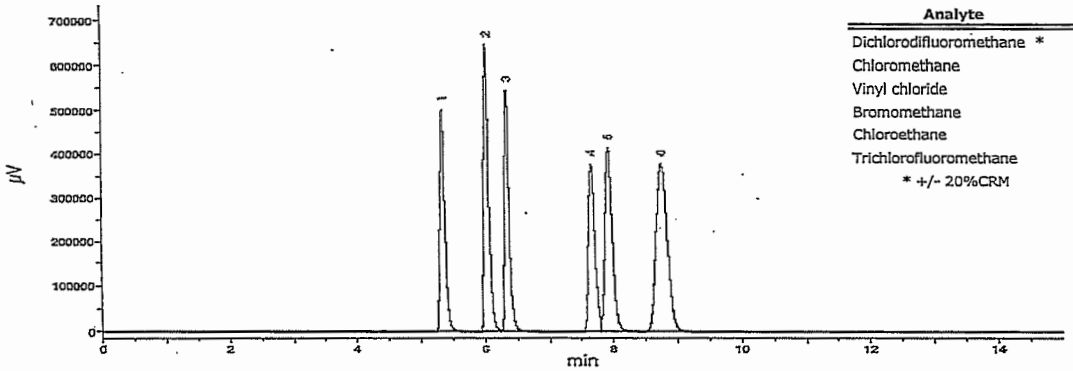
MSDS Information
(Solvent Safety Info. On Attached pg.)

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight (g)	Actual Weight (g)	Actual Conc(µg/mL)	Expanded Uncertainty	CAS#	OSHA PEL (TWA)	LD50
1. Bromomethane	50	01611JX	2000	99.5	0.2	1.00475	1.0069	2004.3	0.00403	00074-83-9	5 ppm (20mg/m3/8H) (skin)	orl-rat 214mg/kg
2. Chloroethane	72	00727KX	2000	99	0.2	1.00982	1.0100	2000.4	0.00405	00075-00-3	1000 ppm (2600mg/m3/8H)	N/A
3. Chloromethane	79	06908MS	2000	99.5	0.2	1.00475	1.0117	2013.8	0.00403	00074-87-3	100 ppm	orl-rat 1800mg/kg
4. Dichlorodifluoromethane	134	92-0487	2000	99	0.2	1.00982	1.0204	2020.9	0.00405	00075-71-8	1000 ppm (4950mg/m3/8H)	N/A
5. Trichlorofluoromethane	294	01823MW	2000	99	0.2	1.00982	1.0150	2010.3	0.00405	00075-69-4	1000 ppm (5600mg/m3/8H)	ipr-mus 1743mg/kg
6. Vinyl chloride	305	1281633 21306138	2000	99.5	0.2	1.00475	1.0113	2013.0	0.00403	00075-01-4	N/A	N/A

Run 9, "P30058 L010213 [2000µg/mL in MeOH]"

Run Length: 15.00 min. 8999 points at 10 points/second.
Created: Wed, Jan 2, 2013 at 5:05:03 PM.
Sampled: Sequence "123112-GC1", Method "GC1-M9".
Analyzed using Method "GC1-M9".

Comments
GC1-M9 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 9 min.), Temp 2 = 200°C (Time 2 = 1 min.),
Rate = 33°C/min., Total run time = 15 min. Injector temp. = 200°C, FID Temp. = 200°C.
ELCD Signal = Edaq Channel 2 PID Signal = Edaq Channel 2
Standard injection = 0.5µL, Range=4 Purge Valve = 0 min



Analyte	ELCD RT (min.)
Dichlorodifluoromethane *	5.34
Chloromethane	6.03
Vinyl chloride	6.34
Bromomethane	7.67
Chloroethane	7.93
Trichlorofluoromethane	8.76

* +/- 20%CRM

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CERTIFIED WEIGHT REPORT

		Lot #	Solvent(s):
Part Number:	32001	DE997Q2	Methanol
Lot Number:	022613		
Description:	EPA Method 502.2/524.2 Volatile Organic Compounds		
	54 components		
Expiration Date:	022616		
Recommended Storage:	Freezer (0 °C)		
Nominal Concentration (µg/mL):	2000		

Formulated By:	Justin Dippold	022613 DATE
Reviewed By:	Pedro L. Rentas	022613 DATE

5E-05 Balance Uncertainty

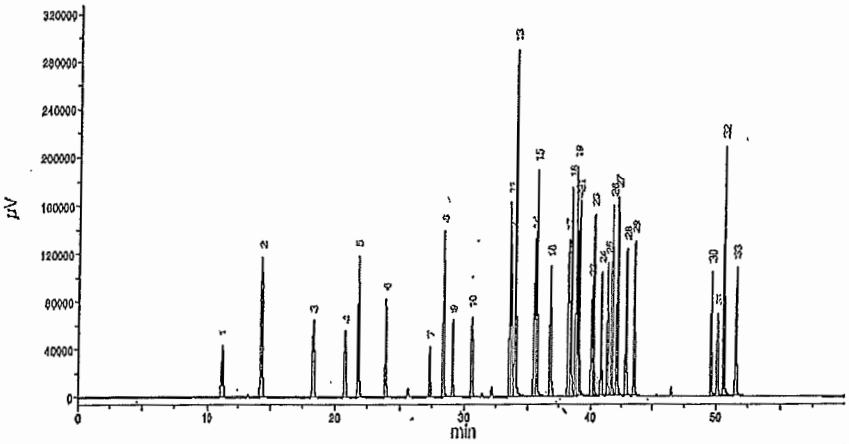
Volume(s) shown below were combined and diluted to: 200.0 0.015 Flask Uncertainty

Compound	Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Uncertainty Pipette	Initial Conc.(ug/mL)	Final Conc.(ug/mL)	Expanded Uncertainty	CAS#	MSDS Information (Solvent Safety Info. On Attached pg.) OSHA PEL (TWA)	LD50
1. Bromodichloromethane	30171	122112	0.10	20.00	0.011	20016.1	2001.5	0.00408	00075-27-4	N/A	orl-rat 916mg/kg
2. Dibromochloromethane	30171	122112	0.10	20.00	0.011	20011.7	2001.1	0.00408	00124-48-1	N/A	orl-rat 848mg/kg
3. cis-1,2-Dichloroethene	30171	122112	0.10	20.00	0.011	20018.4	2001.7	0.00404	00156-59-2	N/A	N/A
4. trans-1,2-Dichloroethene	30171	122112	0.10	20.00	0.011	20001.9	2000.1	0.00408	00156-60-5	N/A	orl-rat 1235mg/kg
5. Methylene chloride	30171	122112	0.10	20.00	0.011	20004.5	2000.4	0.00401	00075-09-2	500 ppm	orl-rat 2136mg/kg
6. 1,1-Dichloroethene	32251	122112	0.10	20.00	0.011	20002.4	2000.1	0.00404	00075-35-4	1 ppm (4mg/m3/8H)	orl-rat 200mg/kg
7. Bromochloromethane	30160	102011	0.10	20.00	0.011	20007.7	2000.7	0.00404	00074-97-5	200 ppm (1050mg/m3/8H)	orl-rat 5000mg/kg
8. Bromoform	30160	102011	0.10	20.00	0.011	20007.6	2000.7	0.00404	00075-25-2	0.5 ppm (5mg/m3) (skin)	orl-rat 1147mg/kg
9. Carbon tetrachloride	30160	102011	0.10	20.00	0.011	20008.4	2000.8	0.00402	00056-23-5	2 ppm (12.6mg/m3/8H)	orl-rat 2350mg/kg
10. Chloroform	30160	102011	0.10	20.00	0.011	20006.5	2000.6	0.00400	00067-66-3	50 ppm (240mg/m3) (CL)	orl-rat 908mg/kg
11. Dibromomethane	30160	102011	0.10	20.00	0.011	20007.7	2000.7	0.00404	00074-95-3	N/A	orl-rat 108mg/kg
12. 1,1-Dichloroethane	30160	102011	0.10	20.00	0.011	20005.3	2000.4	0.00404	00075-34-3	100 ppm	orl-rat 725mg/kg
13. 2,2-Dichloropropane	30160	102011	0.10	20.00	0.011	20011.0	2001.0	0.00408	00594-20-7	N/A	N/A
14. Tetrachloroethene	30160	102011	0.10	20.00	0.011	20017.2	2001.6	0.00404	00127-18-4	5 ppm (170mg/m3/8H)(fina	orl-rat 2629mg/kg
15. 1,1,1-Trichloroethane	30160	102011	0.10	20.00	0.011	20014.4	2001.3	0.00404	00071-55-6	350 ppm (1900mg/m3/8H)	orl-rat 10300mg/kg
16. 1,2-Dibromo-3-chloropropane	30161	072312	0.10	20.00	0.011	20020.9	2002.0	0.00404	00096-12-8	0.001 ppm	orl-rat 170mg/kg
17. 1,2-Dibromoethane	30161	072312	0.10	20.00	0.011	20023.4	2002.2	0.00404	00106-93-4	20 ppm (8H)	orl-rat 108mg/kg
18. 1,2-Dichloroethane	30161	072312	0.10	20.00	0.011	20004.5	2000.4	0.00401	00107-06-2	50 ppm (8H)	orl-rat 670mg/kg
19. 1,2-Dichloropropane	30161	072312	0.10	20.00	0.011	20022.9	2002.2	0.00404	00078-87-5	75 ppm (350mg/m3/8H)	orl-rat 1947mg/kg
20. 1,3-Dichloropropane	30161	072312	0.10	20.00	0.011	20007.0	2000.6	0.00404	00142-28-9	N/A	unr-mus 3600mg/kg
21. 2-Dichloropropene	30161	072312	0.10	20.00	0.011	20022.3	2002.1	0.00404	00563-58-6	N/A	N/A
22. cis-1,3-Dichloropropene	30161	072312	0.10	20.00	0.011	20014.4	2001.3	0.00404	10061-01-5	N/A	N/A
23. trans-1,3-Dichloropropene	30161	072312	0.10	20.00	0.011	20012.2	2001.1	0.00404	10061-02-6	N/A	N/A
24. Hexachloro-1,3-butadiene	30161	072312	0.10	20.00	0.011	20007.3	2000.6	0.00408	00087-68-3	0.02 ppm (0.24mg/m3/8H)	orl-rat 90mg/kg
25. 1,1,1,2-Tetrachloroethane	30161	072312	0.10	20.00	0.011	20007.5	2000.7	0.00404	00630-20-6	N/A	orl-rat 670mg/kg
26. 1,1,2,2-Tetrachloroethane	30161	072312	0.10	20.00	0.011	20008.0	2000.7	0.00404	00079-34-5	5 ppm (35mg/m3/8H)(skin)	orl-rat 800mg/kg
27. 1,1,2-Trichloroethane	30161	072312	0.10	20.00	0.011	20008.2	2000.7	0.00408	00079-00-5	10 ppm (45mg/m3/8H)(skin	orl-rat 836mg/kg
28. Trichloroethene	30161	072312	0.10	20.00	0.011	20012.5	2001.2	0.00402	00079-01-6	50 ppm (270mg/m3/8H)	orl-mus 2402mg/kg
29. 1,2,3-Trichloropropane	30161	072312	0.10	20.00	0.011	20009.5	2000.9	0.00404	00096-18-4	10 ppm (60mg/m3/8H)	orl-rat 320mg/kg
30. Benzene	30162	102711	0.10	20.00	0.011	20014.6	2001.4	0.00415	00071-43-2	1 ppm	orl-rat 4894mg/kg
31. Bromobenzene	30162	102711	0.10	20.00	0.011	20033.7	2003.3	0.00418	00108-86-1	N/A	orl-rat 2699mg/kg
32. n-Butyl benzene	30162	102711	0.10	20.00	0.011	20007.5	2000.7	0.00418	00104-51-8	N/A	N/A
33. Ethyl benzene	30162	102711	0.10	20.00	0.011	20004.9	2000.4	0.00415	00100-41-4	100 ppm (435mg/m3/8H)	orl-rat >2000mg/kg
34. p-Isopropyl toluene	30162	102711	0.10	20.00	0.011	20026.0	2002.5	0.00418	00099-87-6	N/A	orl-rat 4750mg/kg
35. Naphthalene	30162	102711	0.10	20.00	0.011	20011.8	2001.1	0.00418	00091-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
36. Styrene	30162	102711	0.10	20.00	0.011	20011.3	2001.0	0.00418	00100-42-5	100 ppm	orl-rat 5000mg/kg
37. Toluene	30162	102711	0.10	20.00	0.011	20007.1	2000.6	0.00418	00108-88-3	200 ppm	orl-rat 5000mg/kg
38. 1,2,3-Trichlorobenzene	30162	102711	0.10	20.00	0.011	20028.3	2002.7	0.00418	00087-61-6	N/A	ipr-mus 1390mg/kg
39. 1,2,4-Trichlorobenzene	30162	102711	0.10	20.00	0.011	20016.6	2001.6	0.00418	00120-82-1	5 ppm (CL) (40mg/m3)	orl-rat 756mg/kg
40. 1,2,4-Trimethylbenzene	30162	102711	0.10	20.00	0.011	20014.7	2001.4	0.00422	00095-63-6	N/A	orl-rat 5g/kg
41. 1,3,5-Trimethylbenzene	30162	102711	0.10	20.00	0.011	20011.3	2001.0	0.00422	00108-67-8	N/A	N/A
42. m-Xylene	30162	102711	0.10	20.00	0.011	20013.4	2001.3	0.00418	00108-38-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
43. tert-Butyl benzene	30163	102011	0.10	20.00	0.011	20002.3	2000.1	0.00404	00098-06-6	N/A	N/A
44. sec-Butyl benzene	30163	102011	0.10	20.00	0.011	20001.8	2000.1	0.00404	00135-98-8	N/A	orl-rat 2240mg/kg
45. Chlorobenzene	30163	102011	0.10	20.00	0.011	20006.7	2000.6	0.00404	00108-90-7	75 ppm (350mg/m3/8H)	orl-rat 2290mg/kg
46. 2-Chlorotoluene	30163	102011	0.10	20.00	0.011	20006.4	2000.5	0.00404	00095-49-8	50 ppm (250mg/m3/8H)	unr-rat 5700mg/kg
47. 4-Chlorotoluene	30163	102011	0.10	20.00	0.011	20003.7	2000.3	0.00404	00106-43-4	N/A	orl-rat 2100mg/kg
48. 1,2-Dichlorobenzene	30163	102011	0.10	20.00	0.011	20003.1	2000.2	0.00404	00095-50-1	50 ppm (300mg/m3) (CL)	orl-rat 500mg/kg
49. 1,3-Dichlorobenzene	30163	102011	0.10	20.00	0.011	20003.8	2000.3	0.00408	00541-73-1	N/A	ipr-mus 1062mg/kg
50. 1,4-Dichlorobenzene	30163	102011	0.10	20.00	0.011	20029.8	2002.9	0.00404	00106-46-7	75 ppm (450mg/m3/8H)	orl-rat 500mg/kg
51. Isopropylbenzene	30163	102011	0.10	20.00	0.011	20006.1	2000.5	0.00408	00098-82-8	50 ppm (245mg/m3/8H)	orl-rat 1400mg/kg
52. n-Propylbenzene	30163	102011	0.10	20.00	0.011	20013.7	2001.3	0.00408	00103-65-1	N/A	orl-rat 6040mg/kg
53. o-Xylene	30163	102011	0.10	20.00	0.011	20008.2	2000.7	0.00408	00095-47-6	100 ppm (435mg/m3/8H)	ipr-mus 1364mg/kg
54. p-Xylene	30163	102011	0.10	20.00	0.011	20007.6	2000.7	0.00404	00106-42-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg

Run 37, "P32001 L022613 [2000µg/mL in MeOH]-PID"

Run Length: 59.99 min, 35997 points at 10 points/second.
Created: Tue, Feb 26, 2013 at 6:36:10 PM.
Sampled: Sequence "022313-GC1", Method "GC1-M7".
Analyzed using Method "GC1-M7".

Comments
GC1-M7 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 10 min.), Temp 2 = 200°C (Time 2 = 8.75 min.),
Rate = 4°C/min., Total run time = 60 min. Injector temp. = 200°C, PID Temp. = 200°C.
ELCD Signal = Edaq Channel 1 PID Signal = Edaq Channel 2
Standard Injection = 0.5µL, Range=4 Purge Valve = 8 min

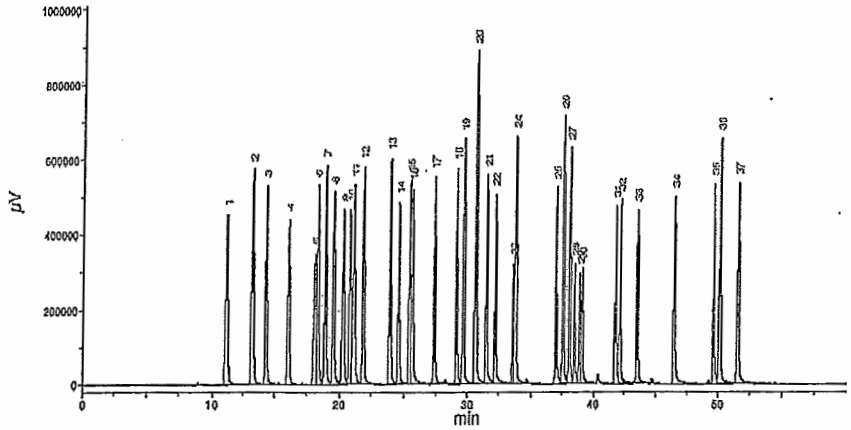


Analyte	PID RT (min.)	ELCD RT (min.)
1,1-Dichloroethene	11.23	11.25
Methylene chloride	NA	13.28
trans-1,2-Dichloroethene	14.32	14.34
1,1-Dichloroethane	NA	16.06
2,2-Dichloropropane	NA	18.11
cis-1,2-Dichloroethene	18.33	18.35
Chloroform	NA	18.92
Bromochloromethane	NA	19.55
1,1,1-Trichloroethane	NA	20.29
1,1-Dichloropropene	20.81	20.84
Carbon tetrachloride	NA	21.16
1,2-Dichloroethane	NA	21.88
Benzene	21.81	NA
Trichloroethene	23.92	23.94
1,2-Dichloropropane	NA	24.62
Bromodichloromethane	NA	25.48
Dibromomethane	NA	25.68
cis-1,3-Dichloropropene	27.34	27.36
Toluene	28.38	NA
trans-1,3-Dichloropropene	29.11	29.14
1,1,2-Trichloroethane	NA	29.67
1,3-Dichloropropane	NA	30.59
Tetrachloroethene	30.59	30.59
Dibromochloromethane	NA	31.47
1,2-Dibromoethane	NA	32.15
Chlorobenzene	33.55	33.57
1,1,1,2-Tetrachloroethane	NA	33.73
Ethylbenzene	33.70	NA
m-Xylene	33.96	NA
p-Xylene	33.96	NA
o-Xylene	35.51	NA
Styrene	35.68	NA
Isopropylbenzene *	36.78	NA
Bromoform	NA	36.98
1,1,2,2-Tetrachloroethane	NA	37.54
1,2,3-Trichloropropane	NA	38.06
n-Propylbenzene	38.22	NA
Bromobenzene	38.42	38.45
1,3,5-Trimethylbenzene	38.78	NA
2-Chlorotoluene	38.87	38.90
4-Chlorotoluene	39.05	39.07
tert-Butylbenzene	40.06	NA
1,2,4-Trimethylbenzene	40.20	NA
sec-Butylbenzene	40.82	NA
p-Isopropyltoluene	41.33	NA
1,3-Dichlorobenzene	41.71	41.73
1,4-Dichlorobenzene	42.11	42.13
n-Butylbenzene	42.83	NA
1,2-Dichlorobenzene	43.47	43.49
1,2-Dibromo-3-chloropropane	NA	46.44
1,2,4-Trichlorobenzene	49.58	49.60
Hexachlorobutadiene	50.06	50.09
Naphthalene	50.58	NA
1,2,3-Trichlorobenzene	51.49	51.52

Run 37, "P32001 L022613 [2000µg/mL in MeOH]-ELCD"

Run Length: 59.99 min, 35997 points at 10 points/second.
Created: Tue, Feb 26, 2013 at 6:36:10 PM.
Sampled: Sequence "022313-GC1", Method "GC1-M7".
Analyzed using Method "GC1-M7".

Comments
GC1-M7 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 10 min.), Temp 2 = 200°C (Time 2 = 8.75 min.),
Rate = 4°C/min., Total run time = 60 min. Injector temp. = 200°C, PID Temp. = 200°C.
ELCD Signal = Edaq Channel 1 PID Signal = Edaq Channel 2
Standard Injection = 0.5µL, Range=4 Purge Valve = 8 min



Recd 9/28/13

TraceCERT®
Traceable Certified Reference Materials

SUPELCO Analytical
595 North Harrison Road · Bellefonte, PA
16823-0048 USA · Phone(814)359-3441

Certificate of Analysis

Description: Methyl tert-butyl ether, 1x1ml, 2000µg/ml in methanol

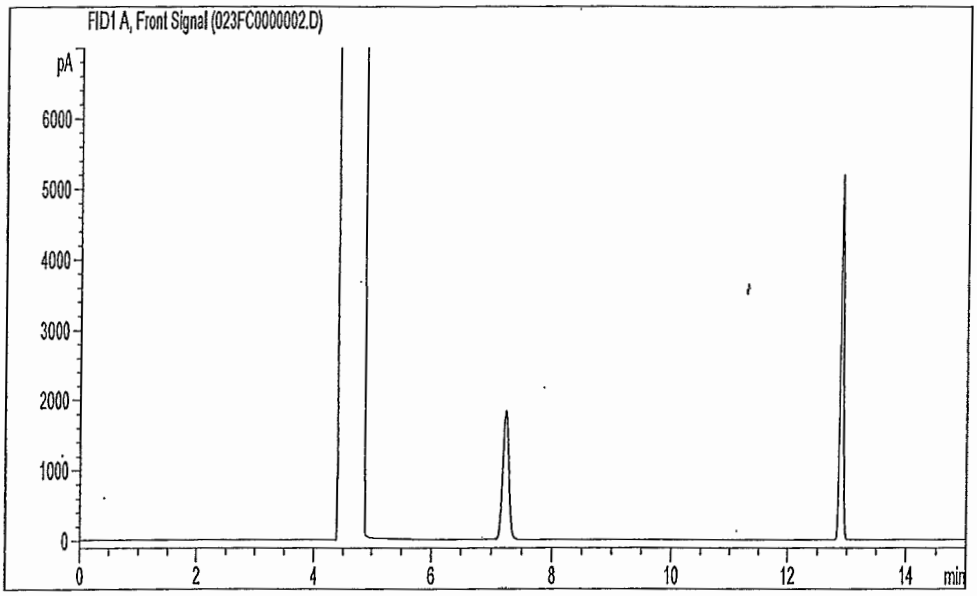
Catalog Number: CRM48483

Lot Number: LB94566

Expiration Date: July 2015

Storage: Room Temperature

Analytical Method Parameters:
Column: VOCOL 105m x 0.53mm x 3.0µm df
50°C for 4 min to 160°C at 10°C/min
Detector: FID, 310°C
Injection Volume: 1.0uL



Elution	Analyte	Lot Number	CAS Number	Chromatographic Purity % (1)	Certified Gravimetric Conc. µg/ml (2)	Expanded Uncertainty µg/ml (3)	Analytical Conc. µg/ml (2)
1.	Methyl tert-Butyl ether	LB94137	1634-04-4	99.9	1999	5.89	2061
	Internal Standard	N/A	N/A	N/A	N/A	N/A	N/A

ACLASS ACCREDITED TESTING Cert# AT-1607

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER Cert# AR-1606

Produced in double accredited laboratory fulfilling
ISO/IEC 17025 and
ISO Guide 34

SIGMA-ALDRICH®

Notes:

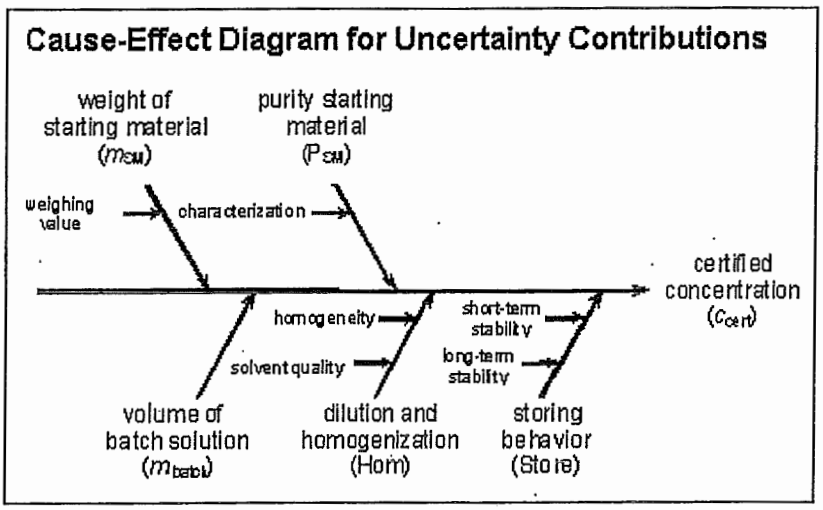
• 1. All starting materials are Certified Reference Materials.

• 2. NIST traceable weights are used to verify balance calibration with the preparation of each lot. Concentration of analyte in solution is ug/ml. Weights are corrected for analytes less than 98% pure.

• 3. Certified value is the gravimetric concentration weighted at room temperature. Uncertainty of the gravimetric concentration in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k = 2. The components of combined standard uncertainty include the uncertainties due to characterization, production, homogeneity, long-term stability and short-term stability. The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies.

• Homogeneity was assessed in accordance with ISO Guide 35. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared by Single Factor Analysis of Variance (ANOVA). The uncertainty due to homogeneity was derived from the ANOVA. Heterogeneity was not detected under the conditions of the ANOVA.

• Product intended for laboratory use only. Supelco warrants that its products conform to the information contained in this publication. Purchaser must determine the suitability of the product for its particular use. Please see the latest catalog or order invoice and packing slip for additional terms and conditions of sale.



Test Date: August 02, 2012
Form: CRM48483

Duane Funk

Duane Funk
QC Manager

ACLASS ACCREDITED TESTING Cert# AT-1607

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER Cert# AR-1606

Produced in double accredited laboratory fulfilling
ISO/IEC 17025 and
ISO Guide 34

SIGMA-ALDRICH®

125 Market Street
New Haven, CT 06513
USA

AccuStandard® Inc.

Rec'd 2/20/14

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

CATALOG NO: S-2932-R1
DESCRIPTION: RMA Compounds
LOT: 212081711
SOLVENT: Methanol

EXPIRATION: Sep 4,2014
DATE CERTIFIED: Sep 4, 2012
SAMPLE SIZE: 1.5 mL
STORAGE CONDITION: Refrig (0-5° C)
HAZARDS: HIGHLY FLAMMABLE

Refer to the MSDS for additional safety information

[X] Included on ISO/IEC 17025 Scope of Accreditation
[X] Included on ISO Guide 34 Scope of Accreditation

Component	Cas Number	Purity % (GC/FID)	Prepared Concentration[1] (µg/mL)	Certified Analyte Concentration[2] (µg/mL)
Acrylonitrile	107-13-1	99.8	400.4	399.6
Bicyclo[2,2,1]hepta-2,5-diene	121-46-0	99.1	201.2	199.4
1,2-Dibromo-3-chloropropane	96-12-8	100	200.7	200.7
Dicyclopentadiene	77-73-6	98.9	201.6	199.4

4 Components

1. All weights are traceable through NIST, Test No. 822-275872-11
2. Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty associated with the gravimetric values reported on this certificate is ±0.24%. The CRM Uncertainty calculated for this product is ±5%. These values are the expanded uncertainty and represent an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.
3. A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot# has had its expiration date extended and is identical to the same lot# without the suffix.

For use in routine laboratory analysis.

Certified by: R. Cooper
Russ Cooper, QC Manager

AccuStandard is accredited to ISO Guide 34, ISO/IEC 17025 and certified to ISO 9001

OR-ORG/INO-001
Rev. 7/11

Absolute Sta ards, Inc.
800-368-1131
www.absolutestandards.com

Certified Re rence Material CRM

Rec'd 8/30/13

ISO 90 S Registered
ISO 17025-34 -43 Accredited
Scopes: http://AbsoluteStandards.com

CERTIFIED WEIGHT REPORT

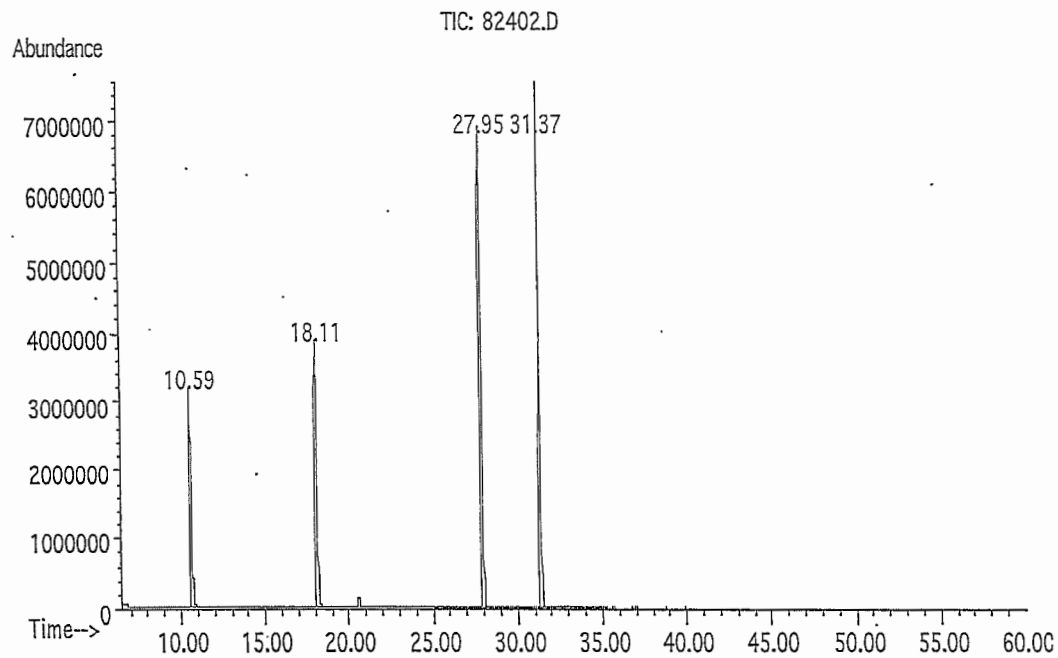
		Lot #	Solvent(s):	
Part Number:	82402	DH247	Methanol	(90%)
Lot Number:	070313	053113	Water	(10%)
Description:	EPA Method 8240A - Mix #2			
	Ketones 4 components			
Expiration Date:	070316			
Recommended Storage:	Refrigerate (4 °C)			
Nominal Concentration (µg/mL):	2000			

Formulated By:	Paul Barron	070313	DATE
Reviewed By:	Pedro L. Rentas	070313	DATE

5E-05 Balance Uncertainty

Volume(s) shown below were combined and diluted to: 200.0 0.015 Flask Uncertainty

Compound	Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Uncertainty Pipette	Initial Conc.(ug/mL)	Final Conc.(ug/mL)	Expanded Uncertainty	MSDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acetone	82492	100412	0.10	20.00	0.011	20009.9	2000.9	0.00402	00067-64-1	750 ppm	orl-rat 9750mg/kg
2. 2-Butanone (Methyl ethyl ketone)	82492	100412	0.10	20.00	0.011	20011.9	2001.1	0.00400	00078-93-3	200 ppm (590mg/m3/8H)	orl-rat 2737mg/kg
3. 2-Hexanone	82492	100412	0.10	20.00	0.011	20010.0	2000.9	0.00408	00591-78-6	100 ppm (410mg/m3/8H)	orl-rat 2590mg/kg
4. 4-Methyl-2-pentanone	82492	100412	0.10	20.00	0.011	20001.5	2000.1	0.00402	00108-10-1	100 ppm (410mg/m3/8H)	orl-rat 2080mg/kg



Method: GC6MSD-1. Detector: Mass Selective Detector. Column: Vocol (60m X 0.25mm ID X 1.5µm film thickness). Oven Profile: Temp. 1 = 35°C (Time 1 = 10min.), Temp. 2=200°C (Time 2 = 8.75 min.), Rate = 4°C/min., Injector Temp. = 200°C, Detector Temp. = 220°C. Analyst: Candice Warren.

Name	MSD RT (min.)
Acetone	10.61
2-Butanone	18.17
4-Methyl-2-pentanone (MEK)	27.94
2-Hexanone	31.41

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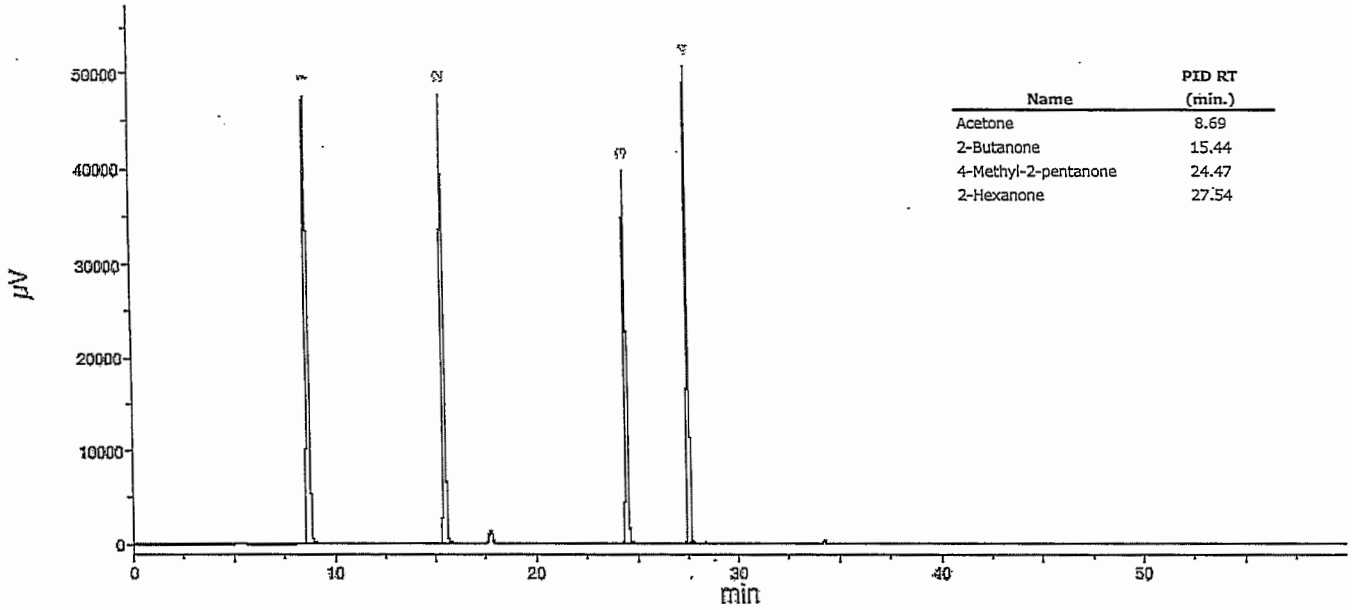
Certified Reference Material CRM

ISO 9001 QS Registered
ISO 17025-34-35-43 Accredited
Scopes: http://AbsoluteStandards.com

Run 12, "P82402 L070313 [2000µg/ml in M:W(9:1)]"

Run Length: 59.99 min, 35997 points at 10 points/second.
Created: Mon, Jul 8, 2013 at 10:21:12 PM.
Sampled: Sequence "070813-GC1", Method "GC1-M7".
Analyzed using default settings.

Comments
GC1-M7 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 10 min.), Temp 2 = 200°C (Time 2 = 8.75 min.),
Rate = 4°C/min., Total run time = 60 min. Injector temp. = 200°C, PID Temp. = 200°C.
ELCD Signal = Edaq Channel 1 PID Signal = Edaq Channel 2
Standard injection = 0.5µL, Range=4 Purge Valve = 8 min



Name	PID RT (min.)
Acetone	8.69
2-Butanone	15.44
4-Methyl-2-pentanone	24.47
2-Hexanone	27.54

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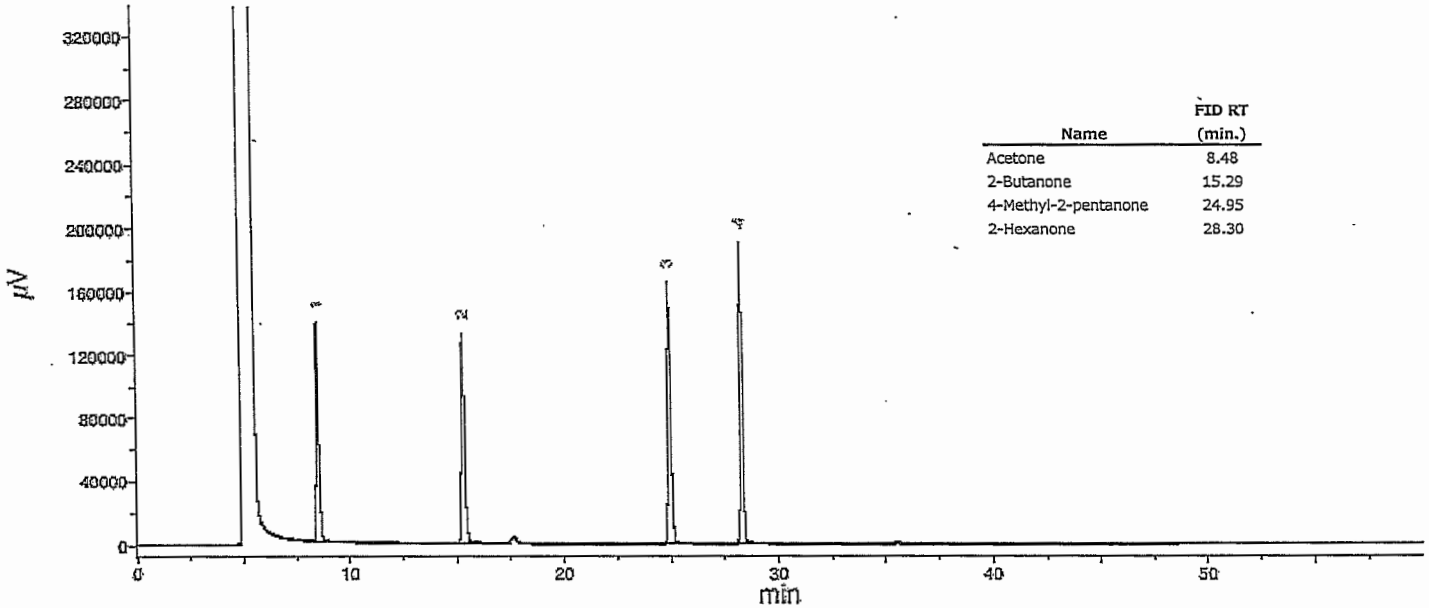
Certified Reference Material CRM

ISO 9001:2008 Registered
ISO 17025-34 -43 Accredited
Scopes: http://AbsoluteStandards.com

Run 10, "P82402 L070313 [2000µg/mL in M:W(9:1)]"

Run Length: 59.99 min, 35995 points at 10 points/second.
Created: Mon, Jul 8, 2013 at 6:38:54 PM.
Sampled: Sequence "070813-GC5M1", Method "GC5-M1".
Analyzed using default settings.

Comments
GC5-M1 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow=290mL/min., Helium (carrier)=10mL/min.,
Helium(make-up)=10mL/min., Hydogen(make-up)=40mL/min., Air(make-up)=230mL/min.
Oven Profile: Temp. 1=35°C (Time 1=10 min.), Temp 2=200°C (Time 2=8.75 min.),
Rate = 4°C/min., Total run time=60 min. Injector temp.=200°C, FID Temp.=200°C.
FID Signal = Edaq Channel 1
Standard injection = 0.5µL, Range=3



Name	FID RT (min.)
Acetone	8.48
2-Butanone	15.29
4-Methyl-2-pentanone	24.95
2-Hexanone	28.30

125 Market Street
New Haven, CT 06513
USA

AccuStandard® Inc.

Rec'd 9/05/12

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

Catalog No: APP-9-035-20X
Description: Carbon disulfide
Lot: 212071234
Solvent: Methanol

Date Certified: Jul 18, 2012
Expiration: Jul 18, 2022
Sample Size: 1 mL
Storage Condition: Refrig (0-5° C)
Hazards: HIGHLY FLAMMABLE

[X] Included on ISO/IEC 17025 Scope of Accreditation
[X] Included on ISO Guide 34 Scope of Accreditation

Component	CAS #	Purity % MFG	Prepared Concentration[1] (µg/mL)	Certified Analyte Concentration[2] (µg/mL)
Carbon disulfide	75-15-0	99.9	2005	2003

AccuStandard follows U.S. conventions in reporting numerical values on both certificates and labels:

A comma (,) is used to separate units of one-thousand or greater.
A period (.) is used as a decimal place marker.

1. All weights are traceable through NIST, Test No.822-275872-11
2. Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty associated with the gravimetric values reported on this certificate is ±0.24%. The CRM Uncertainty calculated for this product is ±5%. These values are the expanded uncertainty and represent an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.
3. A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot# has had its expiration date extended and is identical to the same lot# without the suffix.

For use in routine laboratory analysis.

See reverse side for additional information
Refer to the MSDS for additional safety information

Certified by: R. Cooper
Russ Cooper, QC Manager

AccuStandard is accredited to ISO Guide 34, ISO/IEC 17025 and certified to ISO 9001

OR-ORG/INO-001
Rev. 7/11

Certificate of Analysis

Rec'd 1/11/13

ULTRA SCIENTIFIC
Analytical Solutions

VOC Gas Mixture

Product Number: DWM-544 **Page:** 1 of 1

Lot Number: CJ-4469 **Lot Issue Date:** 18-Dec-2012 **Expiration Date:** 31-Jan-2016

This certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
bromomethane	000074-83-9	RM00064	2001 ± 10 µg/mL
chloroethane	000075-00-3	RM00065	2006 ± 10 µg/mL
chloromethane	000074-87-3	RM05290	2009 ± 10 µg/mL
dichlorodifluoromethane	000075-71-8	RM05289	2008 ± 10 µg/mL
trichlorofluoromethane	000075-69-4	RM00017	2005 ± 10 µg/mL
vinyl chloride	000075-01-4	RM05288	2008 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store at < 4° C

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

A2LA ACCREDITED
ISO 17025:2005 Accredited A2LA Cert. No. 0851-01
ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

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401-294-9400 Fax: 295-2330
wwww.ultrasci.com

William J. Leary
Quality Assurance Manager

Rec'd 6/13/13

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

J.T.Baker

Part of AVANTOR™ PERFORMANCE MATERIALS

Material No.: 9077-02
Batch No.: 0000038701
Manufactured Date: 2013/02/20
Retest Date: 2018/02/19

Certificate of Analysis

Test	Specification	Result
Assay (CH_3OH) (by GC, corrected for water)	>= 99.9 %	100.0
Residue after Evaporation	<= 1.0000 ppm	< 0.1000
Titrable Acid (µeq/g)	<= 0.3	<0.1
Titrable Base (µeq/g)	<= 0.1	<0.01
Water (by KF, coulometric)	<= 0.08 %	<0.01
Photoionization Detection (PID) Below CRQL	Passes Test	PT
Electroconductivity Detection (ELCD) Below CRQL	Passes Test	PT

For Laboratory, Research or Manufacturing Use
Performance Tested for Use in EPA Methods
500 Series for Drinking Water
600 Series for Wastewater
846 for Solid Waste

Country of Origin: US
Packaging Site: Phillipsburg Mfg Ctr & DC

ISO
Phillipsburg, NJ 9001:2008, 14001:2004
Paris, KY 9001:2008
Mexico City, Mexico 9001:2008
Deventer, The Netherlands 9001:2008, 14001:2004, 13485:2003
Gliwice, Poland 9001:2008, 17025:2005
Selangor, Malaysia 9001:2008
Dehradun, India 9001:2008, 14001:2004, 13485:2003
Mumbai, India 9001:2008, 17025:2005
Panoli, India 9001:2008

Richard M Siberski
Global Director of Quality Assurance

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.573.2600
Avantor ™ Performance Materials Inc.
3477 Corporate Parkway, Suite #200, Center Valley, PA 18034, U.S.A. Phone: 610.573.2600 . Fax: 610.573.2610

X1038 IC MIX

8260 Mix (U)	MTBE (U)	RMA (CS)	Ketones (RES)	CS2 (ABS)		MEOH	Final Vol.
DWM-589N Lot CK-2561 2000 ug/mL R4502 Exp.09/30/16	STS-440-1 Lot CG-4444 2000 ug/mL R4230 Exp. 01/31/15	SP-1022-345DSZ Lot 2246900 Varied Conc. R4649 Exp. 12/31/14	30006 Lot A090981 5000 ug/mL R4531 Exp. 12/2015	70060 Lot 121813 1000 ug/mL R4661 Exp. 12/18/16		R4493	(uL)
200	200	400	160	400		2640	4000

Ketones = 200 ug/mL
Acrylo/m&p-Xylenes = 200ug/mL
All other = 100ug/ml

Prep: 02/24/14
Exp: 03/~~07~~/14 03 US 2/26/14

US 2/24/14

X1039 Gases - Abs

100uL 30058 lot 010213 2000ug/mL (R4445) exp. 01/02/16
3900uL MeOH (R4479)
4000uL 50ug/mL US 2/24/14 Exp. 3/~~07~~ 03/14 US 2/24/14

X1040 Anti-Foam Agent (Purge Water)

300mg 31822 lot A0916340 Neat (R4535) exp. 7/2018 Restck
DI Water
1500 mL US 2/25/14 Exp. 2/25/15

X1041 MIX for Archon - UMS5

40uL 8260 MIX(U) DWM-589N-1 lot CK-2561 2000ug/mL(R4502) exp. 9/30/16
16uL DBCP(U) EPA-1021 lot CH-1351 5000ug/mL (R4376) exp. 5/31/15
40uL CS2(Acc) ARP-9-035-20X lot 2/2071234 2.0mg/mL (R4438) exp. 7/18/22
80uL RMA(CS) SP-1022345DSZ lot 2246900 Varied Conc. (R4649) exp. 12/31/14
1824uL MeOH (R4493)
2000uL Acrylo/DBCP = 80ug/mL
Other = 40 ug/mL US 2/25/14 Exp. 3/11/14

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Read and Understood By

Signed	Date	Signed	Date
US	2/25/14	TRS	2/27/14

Rec'd 10/21/13

RESTEK

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Gravimetric Certificate

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 31822 **Lot No.:** A096340

Description : Anti-Foam Agent for Purge & Trap

Antifoaming Agent for Purge and Trap, 1mL/vial

Container Size : 4 mL **Pkg Amt:** > 1 mL

Expiration Date : July 31, 2018 **Storage:** 10°C or colder

Compound #	Compound	CAS #	Percent Purity	Actual Weight	Expanded Uncertainty (95% C.L.; K=2)
1	Antifoam C	unknown	----%	1.0 ml	+/- 0.0058 ml
Solvent:	n/a				

Rebecca Sauer

Date Mixed: 01-Jul-2013 **Balance:** 1128360905

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

Specific Reference Material Notes:

#1 Warm up antifoam to 40°C (you may put the antifoam in the GC oven and heat to 40°C)
#2 After warming, shake vigorously for 3 minutes.
#3 Take a 10ul syringe and wet with methanol (draw 10ul of methanol 3X and empty.)
#4 Using the 10ul emptied syringe pull 1ul of antifoam agent very slowly.
It should take 30 seconds or more to pull up 1ul of antifoam agent into syringe.
#5 inject Antifoam into your 5ml water sample, pull aqueous sample into syringe needle 3X and re-inject.
This will rinse all of the antifoam agent out of the needle and transfer it into your 5ml water sample.
#6 Repeat this procedure for your blank. Always include an antifoam blank with your samples.

X1052 Gases - Ultra

100 ul DWM-544 lot CJ-4469 2000 ug/ml (R4367) exp. 1/31/16
3900 ul MeOH (R4493)
4000 ul 50 ug/ml LS 3/03/14 Exp. 3/10/14
3/17/14 (RMA)

X1053 ISTD - only

80 ul STM-520-1 lot CH-3660 2500 ug/ml (R4399) exp. 12/31/14
3920 ul MeOH (R4493)
4000 ul 50 ug/ml LS 3/12/14 Exp. 3/19/14

X1054 Surrogate - only

80 ul STM-530-1 lot CJ-1280 2500 ug/ml (R4392) exp. 5/31/15
3920 ul MeOH (R4493)
4000 ul 50 ug/ml LS 3/12/14 Exp. 3/19/14

X1055 ICV MIX

8260 Mix (ABS)	MTBE (S)	RMA (ACC)	Ketones (ABS)	CS2 (ACC)	MEOH	Final Vol. (uL)
32001 Lot 100113 2000 ug/mL R4733 Exp.10/01/16	CRM48483 Lot LB94566 2000 ug/mL R4517 Exp. 07/2015	S-2932-R1 Lot 212081711 Varied Conc. R4413 Exp. 9/04/14	82402 Lot 070313 2000 ug/mL R4512 Exp. 07/03/16	APP-9-035-20X Lot 212071234 2.0 mg/mL R4438 Exp. 07/18/22	R4493	
25	25	250	50	25	1625	2000

Ketones/Acrylo/
m&p-Xylenes/DBCP = 50 ug/mL
OTHER = 25 ug/mL

Prep: 03/12/14

EXP: 03/19/14

LS 3/12/14

X1056 Gases - Ultra

100 ul DWM-544 lot CJ-4469 2000 ug/ml (R4367) exp. 1/31/16
3900 ul MeOH (R4493)
4000 ul 50 ug/ml LS 3/12/14 Exp. 3/19/14
Exp. 3/26/14 - RMA

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Read and Understood By

LS Signed 3/12/14 Date

Signed 3/12/14 Date

X1062 ISTD / Sur - UM85

68.8 uL STM-520-1 CH-3660 2500 ug/mL (R4399) exp. 12/31/14
68.8 uL STM-530-1 CJ-1280 2500 ug/mL (R4392) exp. 5/31/15
3862.4 uL MeOH (R4682)
4000 uL 43 ug/mL LS 3/14/14 Exp. 3/28/14

X1063 ICV MIX

8260 Mix (ABS)	MTBE (S)	RMA (ACC)	Ketones (ABS)	CS2 (ACC)	MEOH	Final Vol.
32001 Lot 100113 2000 ug/mL R4733 Exp.10/01/16	CRM48483 Lot LB94566 2000 ug/mL R4517 Exp. 07/2015	S-2932-R1 Lot 212081711 Varied Conc. R4413 Exp. 9/04/14	82402 Lot 070313 2000 ug/mL R4512 Exp. 07/03/16	APP-9-035-20X Lot 212071234 2.0 mg/mL R4438 Exp. 07/18/22	R4682	(uL)
25	25	250	50	25	1625	2000

Ketones/Acrylo/
m&p-Xylenes/DBCP = 50 ug/mL
OTHER = 25 ug/mL

Prep: 03/14/14

EXP: 03/21/14

LS 3/14/14

X1064 IC MIX

8260 Mix (U)	MTBE (U)	RMA (CS)	Ketones (RES)	CS2 (ABS)		MEOH	Final Vol.
DWM-589N Lot CK-2561 2000 ug/mL R4502 Exp.09/30/16	STS-440-1 Lot CG-4444 2000 ug/mL R4230 Exp. 01/31/15	SP-1022-345DSZ Lot 2246900 Varied Conc. R4649 Exp. 12/31/14	30006 Lot A090981 5000 ug/mL R4531 Exp. 12/2015	70060 Lot 121813 1000 ug/mL R4661 Exp. 12/18/16		R4682	(uL)
200	200	400	160	400		2640	4000

Ketones = 200 ug/mL
Acrylo/m&p-Xylenes = 200ug/mL
All other = 100ug/ml

Prep: 03/18/14

Exp: 03/25/14

LS 3/18/14

X1065 8260 MIX - Ceriliant

250 uL ERS-067 lot ER092412-01 200 ug/mL (R4359) exp. 9/2017
750 uL MeOH (R4682)
1000 uL 50 ug/mL LS 3/18/14 Exp. 4/01/14

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LS 3/18/14 Signed Date
Signed Date 3/18/14

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ISO 9001 QS Registered
ISO 17025-34-35-43 Accredited
Scopes: http://AbsoluteStandards.com

Rec'd 1/28/14

TIFIED WEIGHT REPORT

		Lot #	Solvent(s):
Part Number:	32001	DG596Q1	Methanol
Lot Number:	100113		
Description:	EPA Method 502.2/524.2 Volatile Organic Compounds		
	54 components		
Expiration Date:	100116		
Recommended Storage:	Freezer (0 °C)		
Nominal Concentration (µg/mL):	2000		

5E-05 Balance Uncertainty

Volume(s) shown below were combined and diluted to: 200.0 0.015 Flask Uncertainty

Formulated By:	Vincent K. Criscio, Jr.	100113 DATE
Reviewed By:	Pedro L. Rentas	100113 DATE

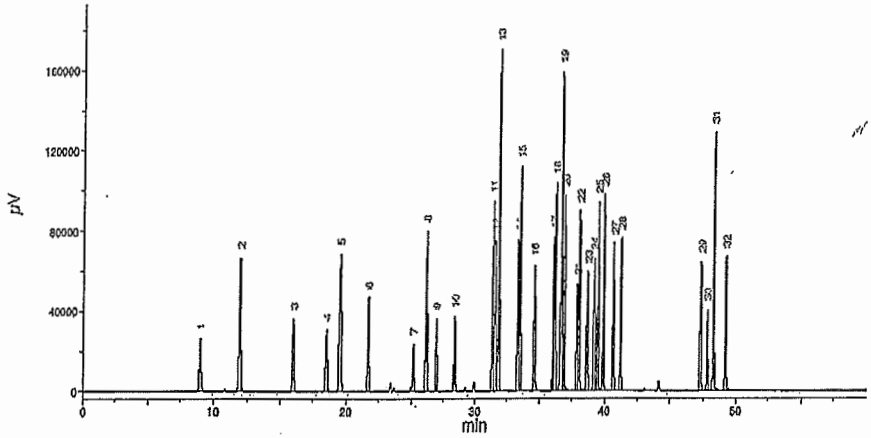
MSDS Information (Solvent Safety Info. On Attached pg.)

Compound	Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Uncertainty Pipette	Initial Conc.(ug/mL)	Final Conc.(ug/mL)	Expanded Uncertainty	CAS#	OSHA PEL (TWA)	LD50
1. Bromodichloromethane	30171	122112	0.10	20.00	0.011	20016.1	2001.5	0.00408	00075-27-4	N/A	orl-rat 916mg/kg
2. Dibromochloromethane	30171	122112	0.10	20.00	0.011	20011.7	2001.1	0.00408	00124-48-1	N/A	orl-rat 848mg/kg
3. cis-1,2-Dichloroethene	30171	122112	0.10	20.00	0.011	20018.4	2001.7	0.00404	00156-59-2	N/A	N/A
4. trans-1,2-Dichloroethene	30171	122112	0.10	20.00	0.011	20001.9	2000.1	0.00408	00156-60-5	N/A	orl-rat 1235mg/kg
5. Methylene chloride	30171	122112	0.10	20.00	0.011	20004.5	2000.4	0.00401	00075-09-2	500 ppm	orl-rat 2136mg/kg
6. 1,1-Dichloroethene	32251	100113	0.10	20.00	0.011	20009.8	2000.9	0.00404	00075-35-4	1 ppm (4mg/m3/8H)	orl-rat 200mg/kg
7. Bromochloromethane	30160	052313	0.10	20.00	0.011	20007.3	2000.6	0.00404	00074-97-5	200 ppm (1050mg/m3/8H)	orl-rat 5000mg/kg
8. Bromoform	30160	052313	0.10	20.00	0.011	20005.9	2000.5	0.00404	00075-25-2	0.5 ppm (5mg/m3) (skin)	orl-rat 1147mg/kg
9. Carbon tetrachloride	30160	052313	0.10	20.00	0.011	20005.6	2000.5	0.00402	00056-23-5	2 ppm (12.6mg/m3/8H)	orl-rat 2350mg/kg
10. Chloroform	30160	052313	0.10	20.00	0.011	20007.3	2000.6	0.00400	00067-66-3	50 ppm (240mg/m3) (CL)	orl-rat 908mg/kg
11. Dibromomethane	30160	052313	0.10	20.00	0.011	20006.1	2000.5	0.00404	00074-95-3	N/A	orl-rat 108mg/kg
12. 1,1-Dichloroethane	30160	052313	0.10	20.00	0.011	20007.3	2000.6	0.00404	00075-34-3	100 ppm	orl-rat 725mg/kg
13. 2,2-Dichloropropane	30160	052313	0.10	20.00	0.011	20005.9	2000.5	0.00408	00594-20-7	N/A	N/A
14. Tetrachloroethene	30160	052313	0.10	20.00	0.011	20008.0	2000.7	0.00404	00127-18-4	5 ppm (170mg/m3/8H)(fina	orl-rat 2629mg/kg
15. 1,1,1-Trichloroethane	30160	052313	0.10	20.00	0.011	20007.3	2000.6	0.00404	00071-55-6	350 ppm (1900mg/m3/8H)	orl-rat 10300mg/kg
16. 1,2-Dibromo-3-chloropropane	30161	072312	0.10	20.00	0.011	20020.9	2002.0	0.00404	00096-12-8	0.001 ppm	orl-rat 170mg/kg
17. 1,2-Dibromoethane	30161	072312	0.10	20.00	0.011	20023.4	2002.2	0.00404	00106-93-4	20 ppm (8H)	orl-rat 108mg/kg
18. 1,2-Dichloroethane	30161	072312	0.10	20.00	0.011	20004.5	2000.4	0.00401	00107-06-2	50 ppm (8H)	orl-rat 670mg/kg
19. 1,2-Dichloropropane	30161	072312	0.10	20.00	0.011	20022.9	2002.2	0.00404	00078-87-5	75 ppm (350mg/m3/8H)	orl-rat 1947mg/kg
1,3-Dichloropropane	30161	072312	0.10	20.00	0.011	20007.0	2000.6	0.00404	00142-28-9	N/A	unr-mus 3600mg/kg
,1-Dichloropropene	30161	072312	0.10	20.00	0.011	20022.3	2002.1	0.00404	00563-58-6	N/A	N/A
22. cis-1,3-Dichloropropene	30161	072312	0.10	20.00	0.011	20014.4	2001.3	0.00404	10061-01-5	N/A	N/A
23. trans-1,3-Dichloropropene	30161	072312	0.10	20.00	0.011	20012.2	2001.1	0.00404	10061-02-6	N/A	N/A
24. Hexachloro-1,3-butadiene	30161	072312	0.10	20.00	0.011	20007.3	2000.6	0.00408	00087-68-3	0.02 ppm (0.24mg/m3/8H)	orl-rat 90mg/kg
25. 1,1,1,2-Tetrachloroethane	30161	072312	0.10	20.00	0.011	20007.5	2000.7	0.00404	00630-20-6	N/A	orl-rat 670mg/kg
26. 1,1,2,2-Tetrachloroethane	30161	072312	0.10	20.00	0.011	20008.0	2000.7	0.00404	00079-34-5	5 ppm (35mg/m3/9H)(skin)	orl-rat 800mg/kg
27. 1,1,2-Trichloroethane	30161	072312	0.10	20.00	0.011	20008.2	2000.7	0.00408	00079-00-5	10 ppm (45mg/m3/8H)(skin	orl-rat 836mg/kg
28. Trichloroethene	30161	072312	0.10	20.00	0.011	20012.5	2001.2	0.00402	00079-01-6	50 ppm (270mg/m3/8H)	orl-mus 2402mg/kg
29. 1,2,3-Trichloropropane	30161	072312	0.10	20.00	0.011	20009.5	2000.9	0.00404	00096-18-4	10 ppm (60mg/m3/8H)	orl-rat 320mg/kg
30. Benzene	30162	071613	0.10	20.00	0.011	20006.4	2000.6	0.00401	00071-43-2	1 ppm	orl-rat 4894mg/kg
31. Bromobenzene	30162	071613	0.10	20.00	0.011	20008.2	2000.7	0.00404	00108-86-1	N/A	orl-rat 2699mg/kg
32. n-Butyl benzene	30162	071613	0.10	20.00	0.011	20014.4	2001.3	0.00404	00104-51-8	N/A	N/A
33. Ethyl benzene	30162	071613	0.10	20.00	0.011	20010.0	2000.9	0.00401	00100-41-4	100 ppm (435mg/m3/8H)	orl-rat >2000mg/kg
34. p-Isopropyl toluene	30162	071613	0.10	20.00	0.011	20012.0	2001.1	0.00404	00099-87-6	N/A	orl-rat 4750mg/kg
35. Naphthalene	30162	071613	0.10	20.00	0.011	20018.7	2001.8	0.00404	00091-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
36. Styrene	30162	071613	0.10	20.00	0.011	20019.9	2001.9	0.00404	00100-42-5	100 ppm	orl-rat 5000mg/kg
37. Toluene	30162	071613	0.10	20.00	0.011	20011.6	2001.1	0.00404	00108-88-3	200 ppm	orl-rat 5000mg/kg
38. 1,2,3-Trichlorobenzene	30162	071613	0.10	20.00	0.011	20020.0	2001.9	0.00404	00087-61-6	N/A	ipr-mus 1390mg/kg
39. 1,2,4-Trichlorobenzene	30162	071613	0.10	20.00	0.011	20013.4	2001.2	0.00404	00120-82-1	5 ppm (CL) (40mg/m3)	orl-rat 756mg/kg
40. 1,2,4-Trimethylbenzene	30162	071613	0.10	20.00	0.011	20012.6	2001.2	0.00408	00095-63-6	N/A	orl-rat 5g/kg
41. 1,3,5-Trimethylbenzene	30162	071613	0.10	20.00	0.011	20007.4	2000.7	0.00408	00108-67-8	N/A	N/A
42. m-Xylene	30162	071613	0.10	20.00	0.011	20010.8	2001.0	0.00404	00108-38-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
43. tert-Butyl benzene	30163	071913	0.10	20.00	0.011	20010.9	2001.0	0.00404	00098-06-6	N/A	N/A
44. sec-Butyl benzene	30163	071913	0.10	20.00	0.011	20014.4	2001.3	0.00404	00135-98-8	N/A	orl-rat 2240mg/kg
45. Chlorobenzene	30163	071913	0.10	20.00	0.011	20011.0	2001.0	0.00404	00108-90-7	75 ppm (350mg/m3/8H)	orl-rat 2290mg/kg
46. 2-Chlorotoluene	30163	071913	0.10	20.00	0.011	20014.5	2001.4	0.00404	00095-49-8	50 ppm (250mg/m3/8H)	unr-rat 5700mg/kg
47. 4-Chlorotoluene	30163	071913	0.10	20.00	0.011	20009.4	2000.8	0.00408	00106-43-4	N/A	orl-rat 2100mg/kg
48. 1,2-Dichlorobenzene	30163	071913	0.10	20.00	0.011	20006.1	2000.5	0.00404	00095-50-1	50 ppm (300mg/m3) (CL)	orl-rat 500mg/kg
49. 1,3-Dichlorobenzene	30163	071913	0.10	20.00	0.011	20006.6	2000.6	0.00408	00541-73-1	N/A	ipr-mus 1062mg/kg
50. 1,4-Dichlorobenzene	30163	071913	0.10	20.00	0.011	20017.2	2001.6	0.00404	00106-46-7	75 ppm (450mg/m3/8H)	orl-rat 500mg/kg
51. Isopropylbenzene	30163	071913	0.10	20.00	0.011	20011.4	2001.0	0.00408	00098-82-8	50 ppm (245mg/m3/8H)	orl-rat 1400mg/kg
52. n-Propylbenzene	30163	071913	0.10	20.00	0.011	20010.0	2000.9	0.00408	00103-65-1	N/A	orl-rat 6040mg/kg
53. o-Xylene	30163	071913	0.10	20.00	0.011	20005.6	2000.5	0.00404	00095-47-6	100 ppm (435mg/m3/8H)	ipr-mus 1364mg/kg
54. p-Xylene	30163	071913	0.10	20.00	0.011	20013.8	2001.3	0.00404	00106-42-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg

Run 10, "P32001 L100113 [2000µg/mL in MeOH]-PID"

Run Length: 59.99 min, 35996 points at 10 points/second.
Created: Tue, Oct 1, 2013 at 8:42:31 PM.
Sampled: Sequence "100113-GC1", Method "GC1-M7".
Analyzed using Method "GC1-M7".

Comments
GC1-M7 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 10 min.), Temp 2 = 200°C (Time 2 = 8.75 min.),
Rate = 4°C/min., Total run time = 60 min. Injector temp. = 200°C, PID Temp. = 200°C.
ELCD Signal = Edaq Channel 1 PID Signal = Edaq Channel 2
Standard Injection = 0.5µL, Range=4 Purge Valve = 8 min

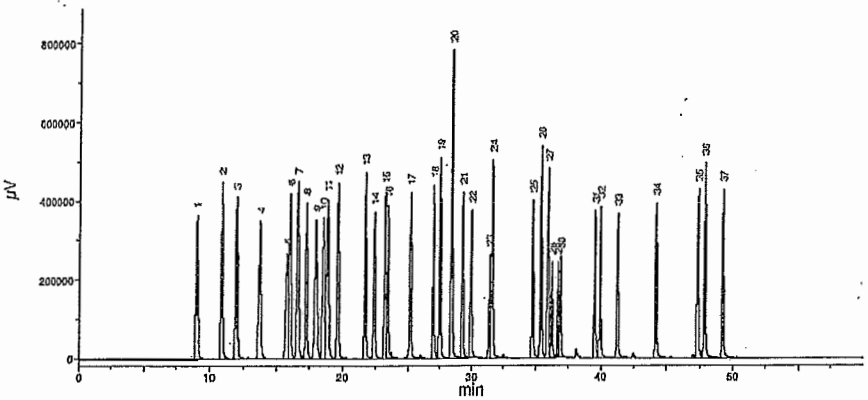


Analyte	PID RT (min.)	ELCD RT (min.)
1,1-Dichloroethene	8.90	8.92
Methylene chloride	NA	10.87
trans-1,2-Dichloroethene	11.91	11.93
1,1-Dichloroethane	NA	13.68
2,2-Dichloropropane	NA	15.76
cis-1,2-Dichloroethene	15.98	16.00
Chloroform	NA	16.58
Bromochloromethane	NA	17.20
1,1,1-Trichloroethane	NA	17.95
1,1-Dichloropropene	18.50	18.52
Carbon tetrachloride	NA	18.82
1,2-Dichloroethane	NA	19.59
Benzene	19.50	NA
Trichloroethene	21.65	21.68
1,2-Dichloropropane	NA	22.37
Bromodichloromethane	NA	23.22
Dibromomethane	NA	23.41
cis-1,3-Dichloropropene	25.14	25.17
Toluene	26.16	NA
trans-1,3-Dichloropropene	26.95	26.97
1,1,2-Trichloroethane	NA	27.48
1,3-Dichloropropane	NA	28.39
Tetrachloroethene	28.36	28.39
Dibromochloromethane	NA	29.24
1,2-Dibromoethane	NA	29.92
Chlorobenzene	31.34	31.35
1,1,1,2-Tetrachloroethane	NA	31.54
Ethylbenzene	31.52	NA
m-Xylene	31.79	NA
p-Xylene	31.79	NA
o-Xylene	33.32	NA
Styrene	33.50	NA
Isopropylbenzene	34.61	NA
Bromoform	NA	34.73
1,1,2,2-Tetrachloroethane	NA	35.37
1,2,3-Trichloropropane	NA	35.89
n-Propylbenzene	36.05	NA
Bromobenzene	36.19	36.21
1,3,5-Trimethylbenzene	36.64	NA
2-Chlorotoluene	36.64	36.69
4-Chlorotoluene	36.85	36.87
tert-Butylbenzene	37.68	NA
1,2,4-Trimethylbenzene	38.02	NA
sec-Butylbenzene	38.64	NA
p-Isopropyltoluene	39.17	NA
1,3-Dichlorobenzene	39.48	39.50
1,4-Dichlorobenzene	39.88	39.91
n-Butylbenzene	40.65	NA
1,2-Dichlorobenzene	41.21	41.23
1,2-Dibromo-3-chloropropane	NA	44.18
1,2,4-Trichlorobenzene	47.30	47.32
Hexachlorobutadiene	47.80	47.82
Naphthalene	48.27	NA
1,2,3-Trichlorobenzene	49.17	49.19

Run 10, "P32001 L100113 [2000µg/mL in MeOH]-ELCD"

Run Length: 59.99 min, 35996 points at 10 points/second.
Created: Tue, Oct 1, 2013 at 8:42:31 PM.
Sampled: Sequence "100113-GC1", Method "GC1-M7".
Analyzed using Method "GC1-M7".

Comments
GC1-M7 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow = 150mL/min., Helium (carrier) = 10mL/min.,
Helium (make-up) = 40mL/min., Hydogen (make-up) = 100mL/min.,
Oven Profile: Temp. 1 = 35°C (Time 1 = 10 min.), Temp 2 = 200°C (Time 2 = 8.75 min.),
Rate = 4°C/min., Total run time = 60 min. Injector temp. = 200°C, PID Temp. = 200°C.
ELCD Signal = Edaq Channel 1 PID Signal = Edaq Channel 2
Standard Injection = 0.5µL, Range=4 Purge Valve = 8 min



Analytical Run Number _____

Calibration Information

Tune Data (If applicable)

Initial Calibration (If different than Initial Calibration in Run 1)
- Calibration Factor Summary
- Chromatogram
- Quant Report (If applicable)

Continuing Calibration
- Calibration Response Check
- Chromatogram
- Quant Report (If applicable)

Instrument Logs/Analysis Notebook Pages

Blank / Field Sample / QC Data

Sample Results
Chromatogram
Quant Report (If applicable)
Confirmation Analysis Quant Report / Chromatogram (If applicable)
Tentatively Identified Compounds (If required)

Rev. 1.1

Calibration Information

Tune Data (If applicable)

Initial Calibration (If different than Initial Calibration in Run 1)
- Calibration Factor Summary
- Chromatogram
- Quant Report (If applicable)

Continuing Calibration
- Calibration Response Check
- Chromatogram
- Quant Report (If applicable)

Rev. 1.1

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ARDL, Inc. Contract: ---

Lab Code: --- Case No.: 006615 SAS No.: --- SDG No.: ---

Lab File ID: A0212408 BFB Injection Date: 02/12/14

Instrument ID: AG1 BFB Injection Time: 14:43

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	17.1	
75	30.0 - 66.0% of mass 95	46.9	
95	Base Peak, 100% relative abundance	100.	
96	5.0 - 9.0% of mass 95	7.4	
173	Less than 2.0% of mass 174	0.0	(1)
174	Greater than 50.0% of mass 95	73.7	
175	4.0 - 9.0% of mass 174	8.0	(1)
176	Greater than 93.0%, but less that 101.0% of mass 174	100.8	(1)
177	5.0 - 9.0% of mass 176	6.1	(2)

(1)-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	BLK STD	000 STD	A0212411	02/12/14	16:06
2	VOA STD	12.5 STD	A0212412	02/12/14	16:36
3	VOA STD	025 STD	A0212413	02/12/14	17:04
4	VOA STD	050 STD	A0212414	02/12/14	17:33
5	VOA STD	075 STD	A0212415	02/12/14	18:03
6	VOA STD	100 STD	A0212416	02/12/14	18:32
7	VOA STD	125 STD	A0212417	02/12/14	19:02
8	VOA STD	150 STD	A0212418	02/12/14	19:32
9	VOA STD	200 STD	A0212419	02/12/14	20:03
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

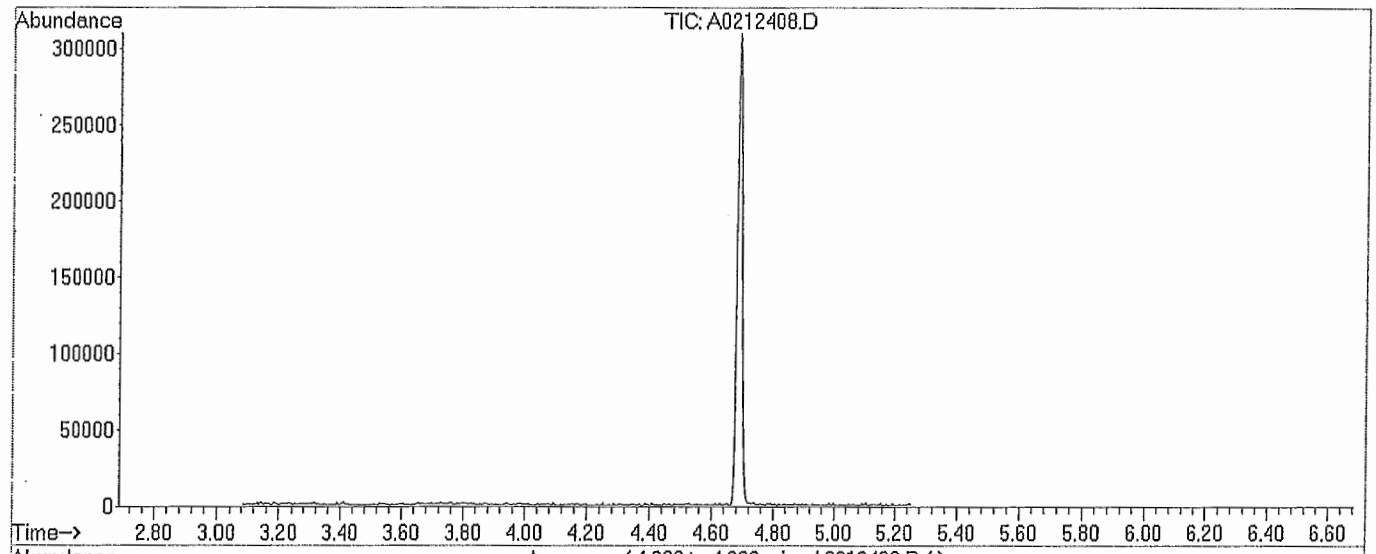
page 1 of 1 FORM V VOA 3/90

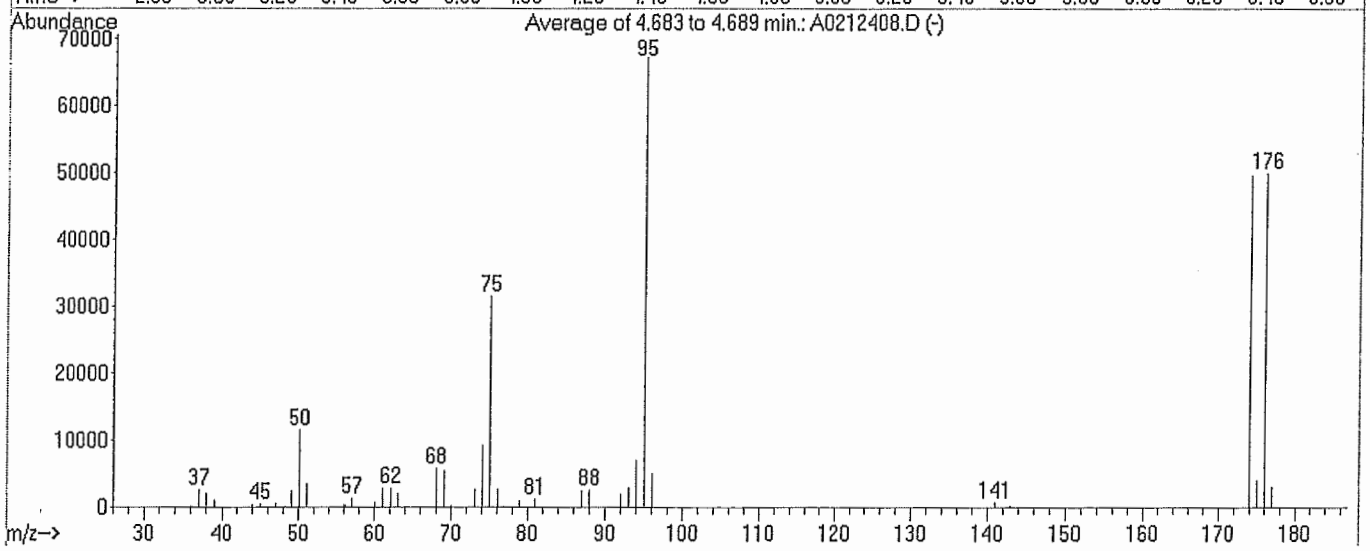
BFB

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212408.D
Acq On : 12 Feb 2014 2:43 pm
Operator :
Sample : 50 NG BFB
Misc : 8260
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\MSDCHEM\1\METHODS\BFBSOIL.M
Title :
Last Update :





AutoFind: Scans 499, 500, 501; Background Corrected with Scan 490

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.1	11491	PASS
75	95	30	66	46.9	31506	PASS
95	95	100	100	100.0	67170	PASS
96	95	5	9	7.4	4947	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	73.7	49517	PASS
175	174	4	9	8.0	3969	PASS
176	174	93	101	100.8	49920	PASS
177	176	5	9	6.1	3069	PASS

Average of 4.683 to 4.689 min.: A0212408.D
50 NG BFB
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
36.00	186	51.05	3475	70.00	222	93.00	2860
36.20	188	56.00	376	73.05	2609	94.00	6957
37.10	2609	56.20	351	74.05	9265	95.00	67170
38.05	2082	57.05	1345	75.05	31506	96.05	4947
39.05	990	60.05	672	76.10	2689	140.95	731
44.00	396	61.05	2763	76.90	190	142.80	254
45.00	481	62.10	2839	78.95	978	143.00	220
47.10	562	63.05	2070	80.95	1238	173.95	49517
48.20	173	64.00	167	87.00	2406	174.95	3969
49.00	2452	68.00	5774	87.95	2558	176.00	49920
50.10	11491	69.05	5444	92.00	1935	176.95	3069

Response Factor Report AG1

Method Path : C:\MSDCHEM\1\METHODS\
Method File : SOIL_44HI.M
Title : 8260 VOLATILES
Last Update : Thu Mar 20 08:47:48 2014
Response Via : Initial Calibration

Calibration Files
12.5=A0212412.D 25 =A0212413.D 50 =A0212414.D
75 =A0212415.D 100 =A0212416.D 125 =A0212417.D

		Compound	12.5	25	50	75	100	125	Avg	%RSD
1)	I	Chlorobenzene-d5	----------ISTD----------							
2)	S	Toluene-d8	1.834	1.970	2.327	2.462	2.350	2.487	2.266	10.36
3)	MCT	Toluene	2.260	3.369	3.117	3.069	2.947	3.329	3.029	11.43
4)	CT	Ethylbenzene	3.093	4.137	3.732	3.610	3.473	3.945	3.654	8.75
5)	T	m & p-Xylene	2.375	3.436	3.028	2.949	2.832	3.202	2.960	10.45
6)	T	Styrene	1.482	2.472	2.280	2.236	2.201	2.469	2.217	14.32
7)	T	o-Xylene	0.875	1.378	1.288	1.276	1.262	1.446	1.277	13.80
8)	I	1,4-Dichlorobenzene-d	----------ISTD----------							
9)	S	4-Bromofluorobenz	0.832	0.829	0.948	0.993	0.977	1.024	0.951	8.29
10)	T	1,2,4-Trimethylbe	2.402	3.578	3.438	3.346	3.340	3.719	3.351	12.10

(#) = Out of Range ### Number of calibration levels exceeded format ###

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212411.D
Acq On : 12 Feb 2014 4:06 pm
Operator :
Sample : VSTD000
Misc : 8260
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 20 08:23:36 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:23:31 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	299125	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	274646	125.00	ug/Kg	0.21

System Monitoring Compounds

2) Toluene-d8	0.00	98	0	0.00	ug/Kg
Spiked Amount 100.000			Recovery =	0.00%	
9) 4-Bromofluorobenzene	0.00	95	0	0.00	ug/Kg
Spiked Amount 100.000			Recovery =	0.00%	

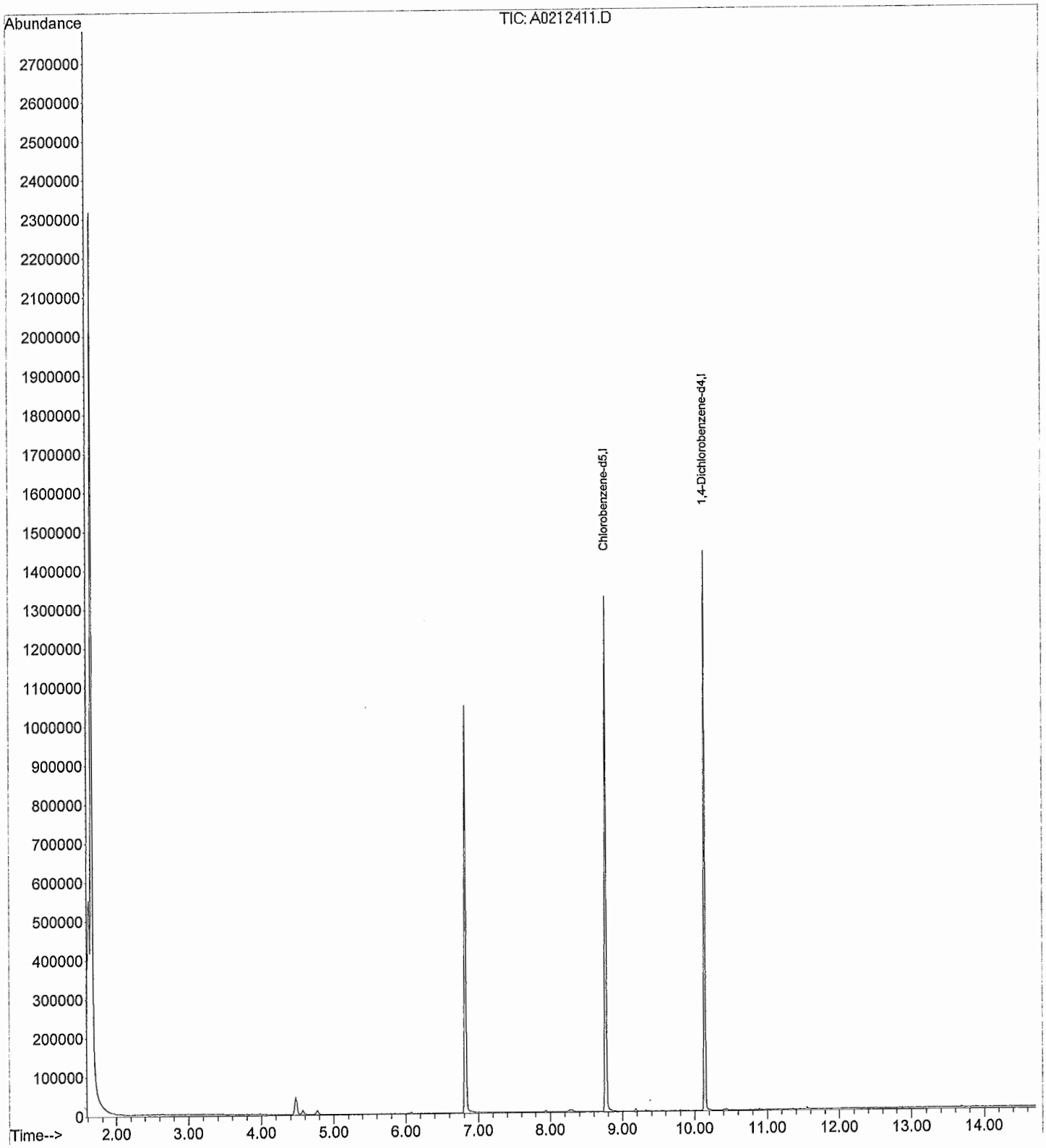
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212411.D
Acq On : 12 Feb 2014 4:06 pm
Operator :
Sample : VSTD000
Misc : 8260
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 20 08:23:36 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:23:31 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212412.D
Acq On : 12 Feb 2014 4:36 pm
Operator :
Sample : VSTD12.5
Misc : 8260
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 20 08:29:38 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

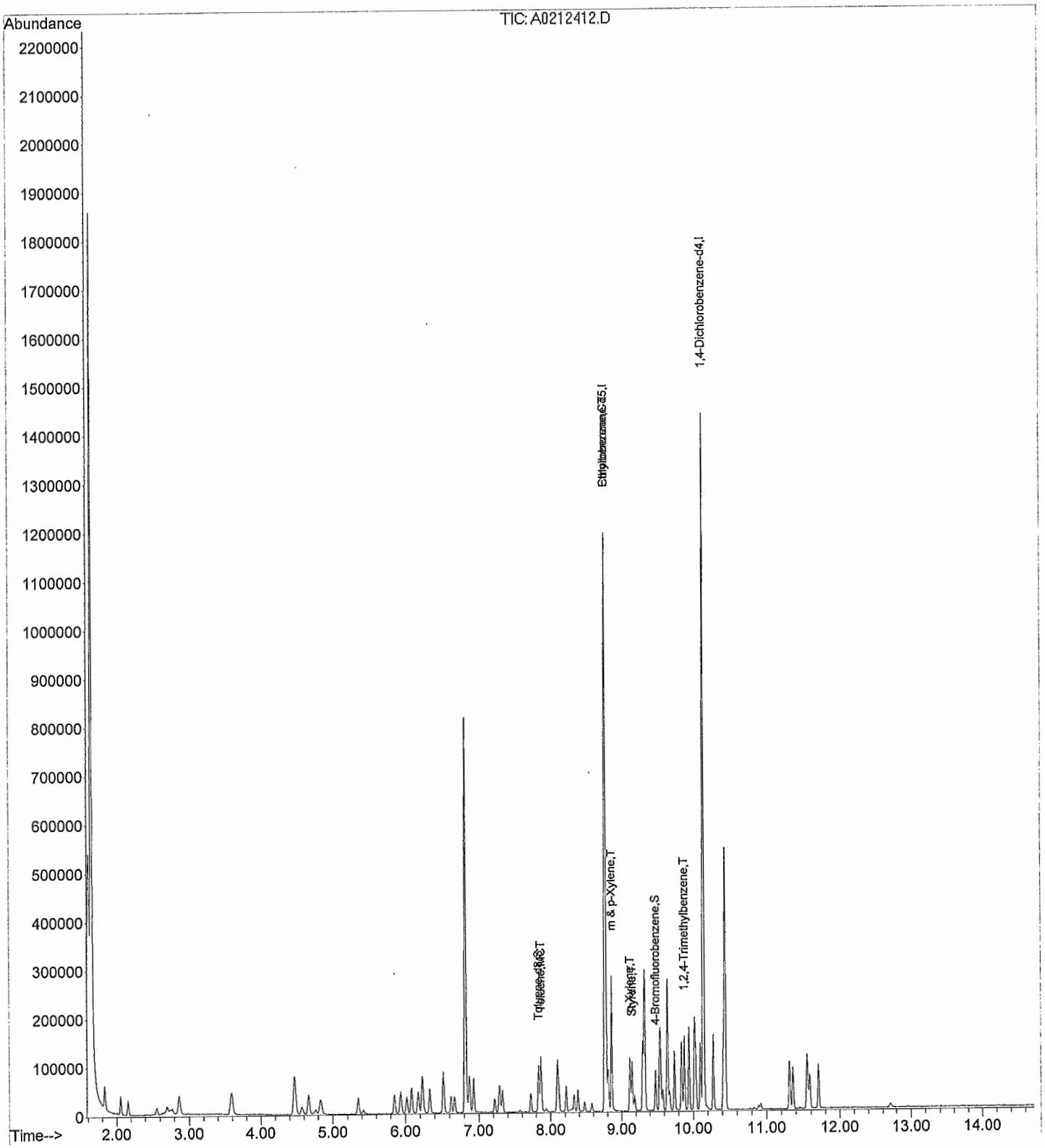
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	250789	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	265115	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	45998	10.17 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 10.17%	
9) 4-Bromofluorobenzene	9.48	95	22046	11.39 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 11.39%	
Target Compounds					Qvalue
3) Toluene	7.87	91	56679	9.61 ug/Kg	99
4) Ethylbenzene	8.78	91	77557	11.14 ug/Kg	94
5) m & p-Xylene	8.86	91	119133	21.09 ug/Kg	93
6) Styrene	9.15	104	37160	8.82 ug/Kg	95
7) o-Xylene	9.12	106	21948	8.29 ug/Kg	87
10) 1,2,4-Trimethylbenzene	9.88	105	63676	9.43 ug/Kg	91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212412.D
Acq On : 12 Feb 2014 4:36 pm
Operator :
Sample : VSTD12.5
Misc : 8260
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 20 08:29:38 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212413.D
Acq On : 12 Feb 2014 5:04 pm
Operator :
Sample : VSTD025
Misc : 8260
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 20 08:30:25 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

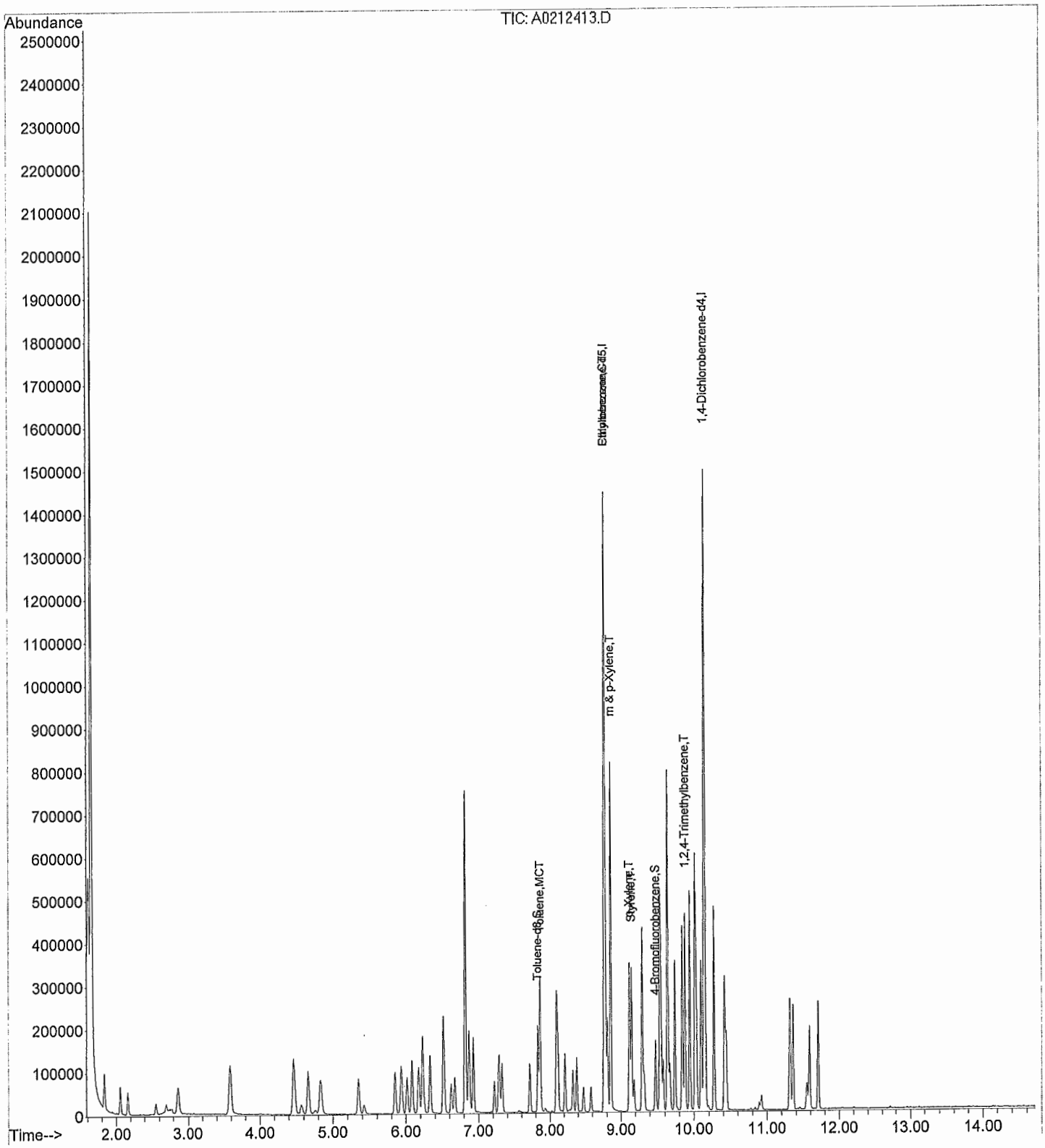
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	249286	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	266176	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	98242	21.85 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 21.85%	
9) 4-Bromofluorobenzene	9.48	95	44133	22.72 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 22.72%	
Target Compounds					Qvalue
3) Toluene	7.86	91	167991	28.66 ug/Kg	99
4) Ethylbenzene	8.78	91	206260	29.81 ug/Kg	98
5) m & p-Xylene	8.86	91	342665	61.02 ug/Kg	94
6) Styrene	9.15	104	123233	29.43 ug/Kg	94
7) o-Xylene	9.12	106	68699	26.10 ug/Kg	89
10) 1,2,4-Trimethylbenzene	9.88	105	190500	28.10 ug/Kg	95

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212413.D
Acq On : 12 Feb 2014 5:04 pm
Operator :
Sample : VSTD025
Misc : 8260
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 20 08:30:25 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212414.D
Acq On : 12 Feb 2014 5:33 pm
Operator :
Sample : VSTD050
Misc : 8260
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 20 08:31:01 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

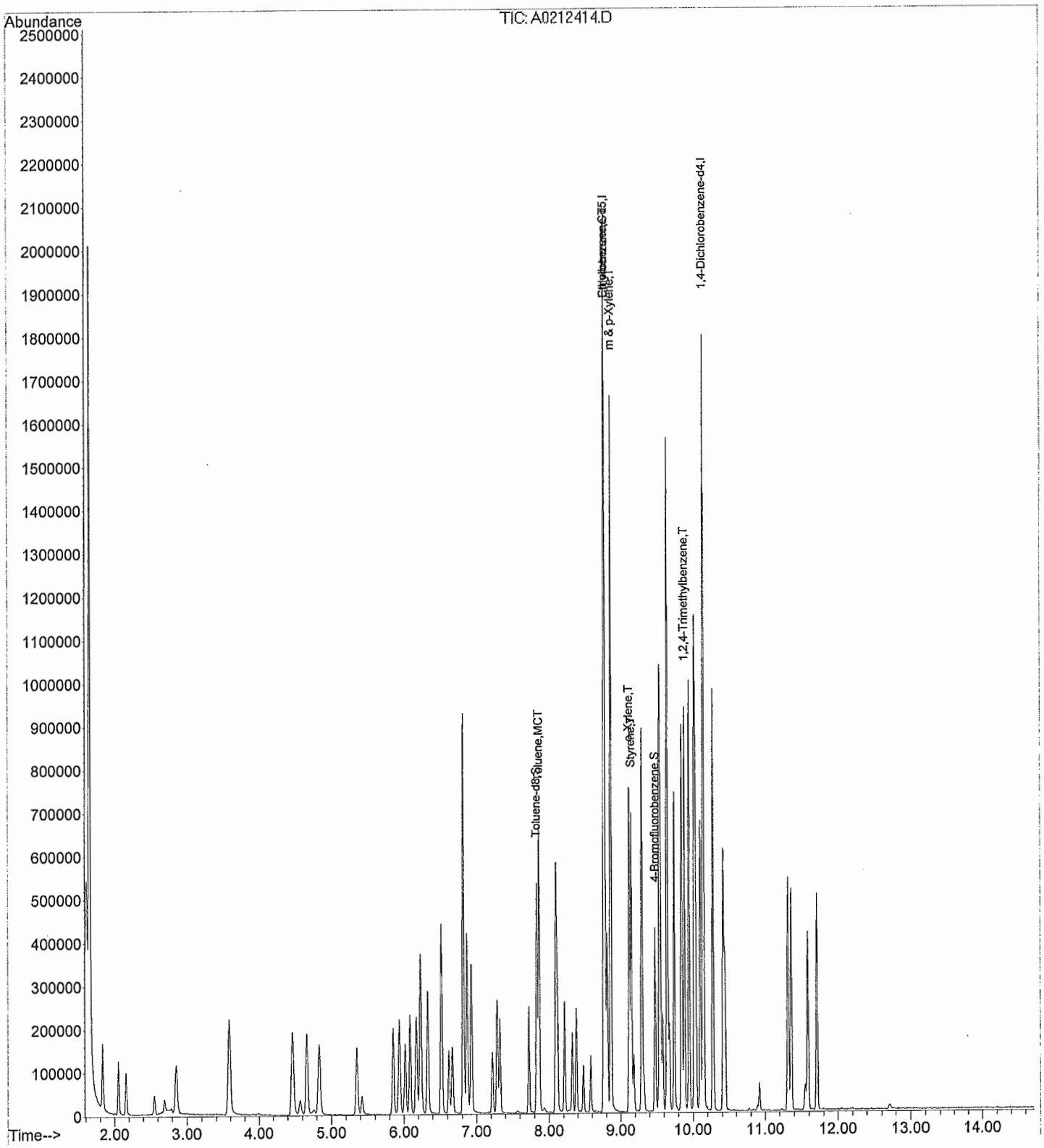
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	282745	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	284885	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	263178	51.60 ug/Kg	0.00
Spiked Amount 100.000			Recovery =	51.60%	
9) 4-Bromofluorobenzene	9.48	95	108054	51.97 ug/Kg	0.00
Spiked Amount 100.000			Recovery =	51.97%	
Target Compounds					Qvalue
3) Toluene	7.86	91	352532	53.03 ug/Kg	100
4) Ethylbenzene	8.78	91	422118	53.79 ug/Kg	97
5) m & p-Xylene	8.86	91	685030	107.55 ug/Kg	93
6) Styrene	9.15	104	257893	54.30 ug/Kg	94
7) o-Xylene	9.11	106	145708	48.82 ug/Kg	89
10) 1,2,4-Trimethylbenzene	9.88	105	391726	53.98 ug/Kg	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212414.D
Acq On : 12 Feb 2014 5:33 pm
Operator :
Sample : VSTD050
Misc : 8260
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 20 08:31:01 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212415.D
Acq On : 12 Feb 2014 6:03 pm
Operator :
Sample : VSTD075
Misc : 8260
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 20 08:31:44 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

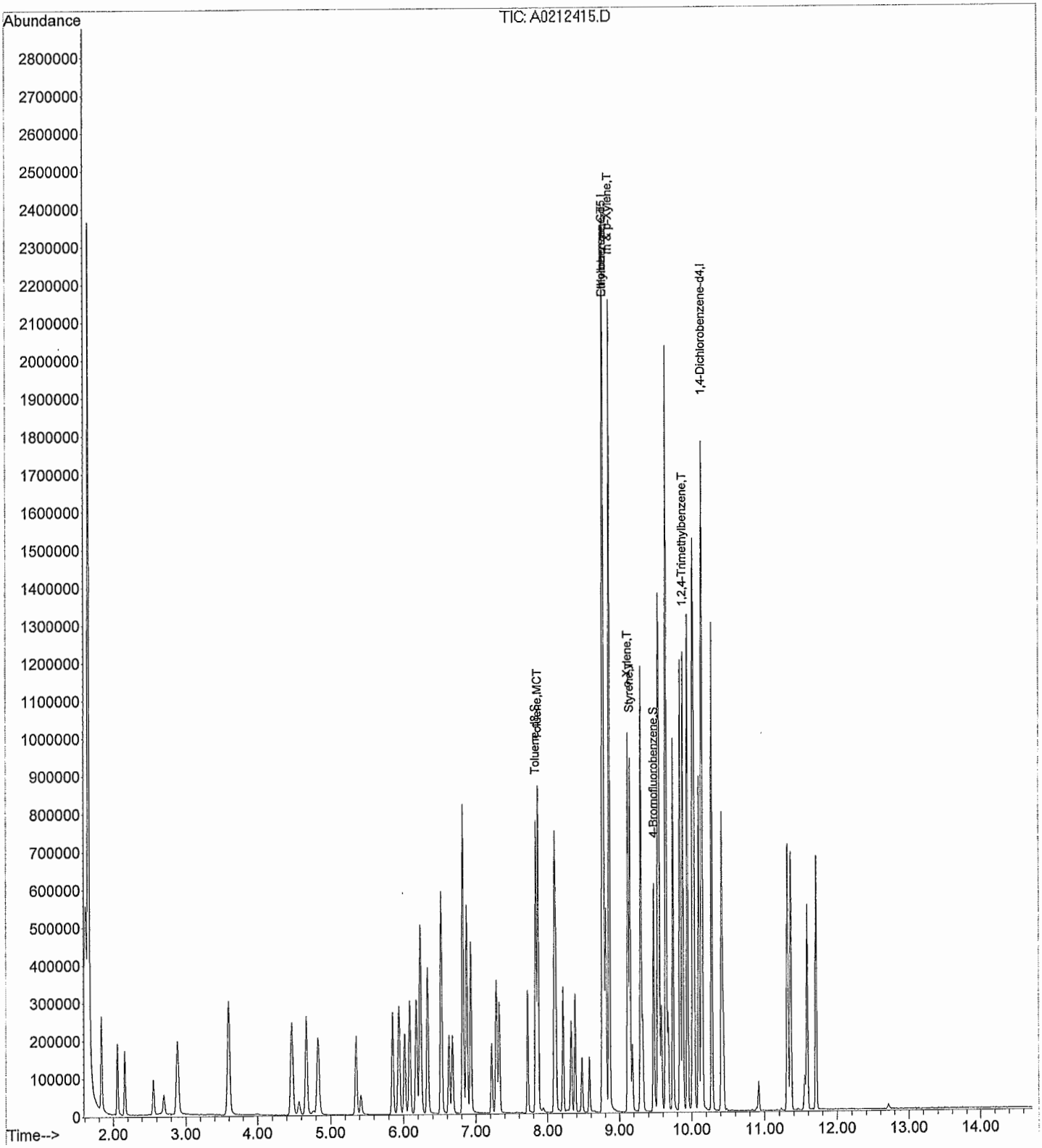
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	257326	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	257061	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	380092	81.89	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 81.89%			
9) 4-Bromofluorobenzene	9.48	95	153123	81.62	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 81.62%			
Target Compounds						Qvalue
3) Toluene	7.86	91	473913	78.33	ug/Kg	100
4) Ethylbenzene	8.78	91	557331	78.04	ug/Kg	96
5) m & p-Xylene	8.86	91	910493	157.06	ug/Kg	93
6) Styrene	9.15	104	345231	79.87	ug/Kg	93
7) o-Xylene	9.11	106	196996	72.52	ug/Kg	84
10) 1,2,4-Trimethylbenzene	9.88	105	516084	78.81	ug/Kg	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212415.D
Acq On : 12 Feb 2014 6:03 pm
Operator :
Sample : VSTD075
Misc : 8260
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 20 08:31:44 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212416.D
Acq On : 12 Feb 2014 6:32 pm
Operator :
Sample : VSTD100
Misc : 8260
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 20 08:32:11 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

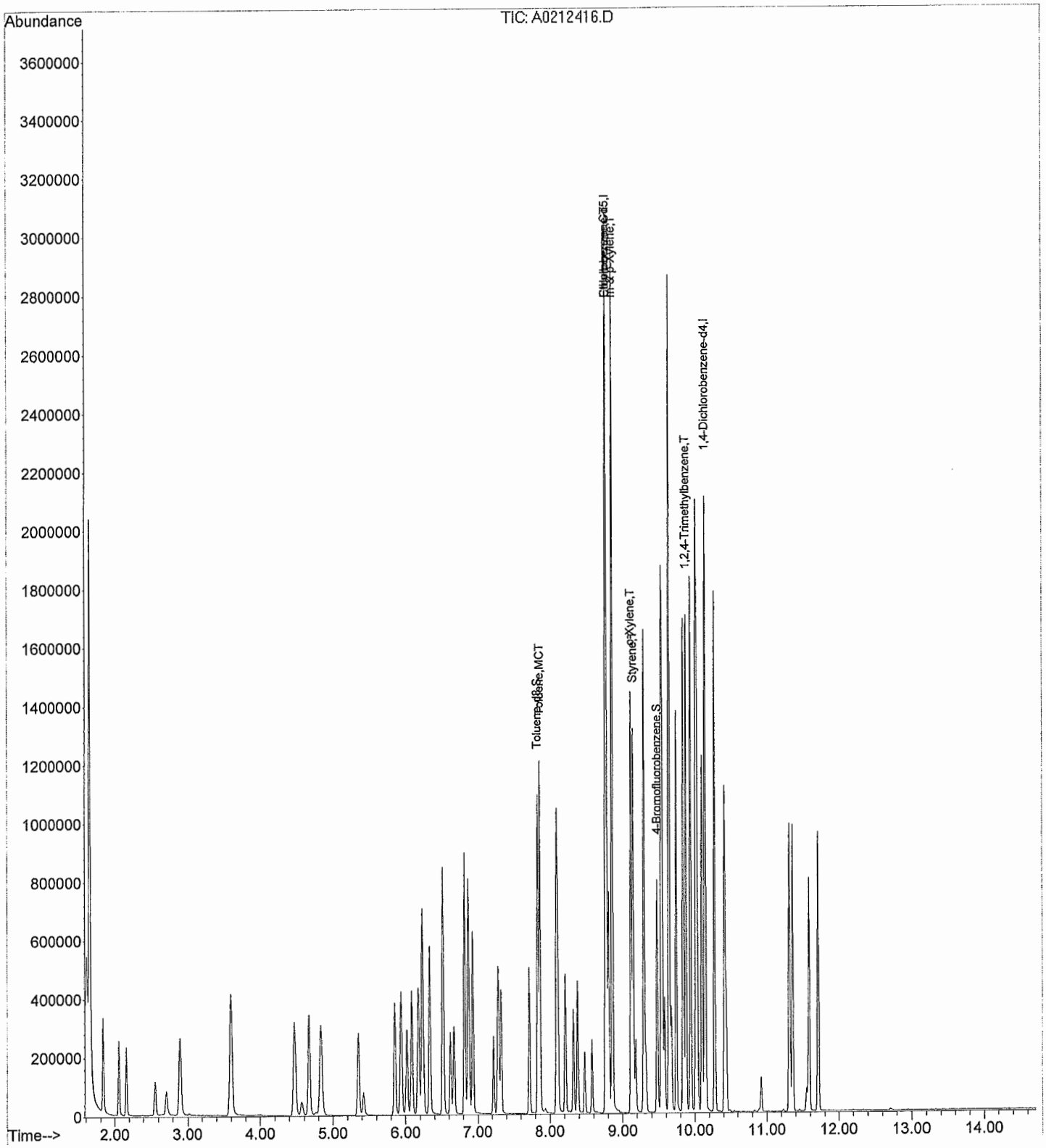
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	279384	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	268227	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	525140	104.21	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	104.21%	
9) 4-Bromofluorobenzene	9.47	95	209623	107.08	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	107.08%	
Target Compounds						Qvalue
3) Toluene	7.86	91	658595	100.26	ug/Kg	100
4) Ethylbenzene	8.78	91	776236	100.11	ug/Kg	97
5) m & p-Xylene	8.86	91	1266059	201.15	ug/Kg	93
6) Styrene	9.15	104	491861	104.80	ug/Kg	91
7) o-Xylene	9.11	106	282160	95.67	ug/Kg	84
10) 1,2,4-Trimethylbenzene	9.88	105	716744	104.90	ug/Kg	91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212416.D
Acq On : 12 Feb 2014 6:32 pm
Operator :
Sample : VSTD100
Misc : 8260
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 20 08:32:11 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212417.D
Acq On : 12 Feb 2014 7:02 pm
Operator :
Sample : VSTD125
Misc : 8260
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 20 08:39:39 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

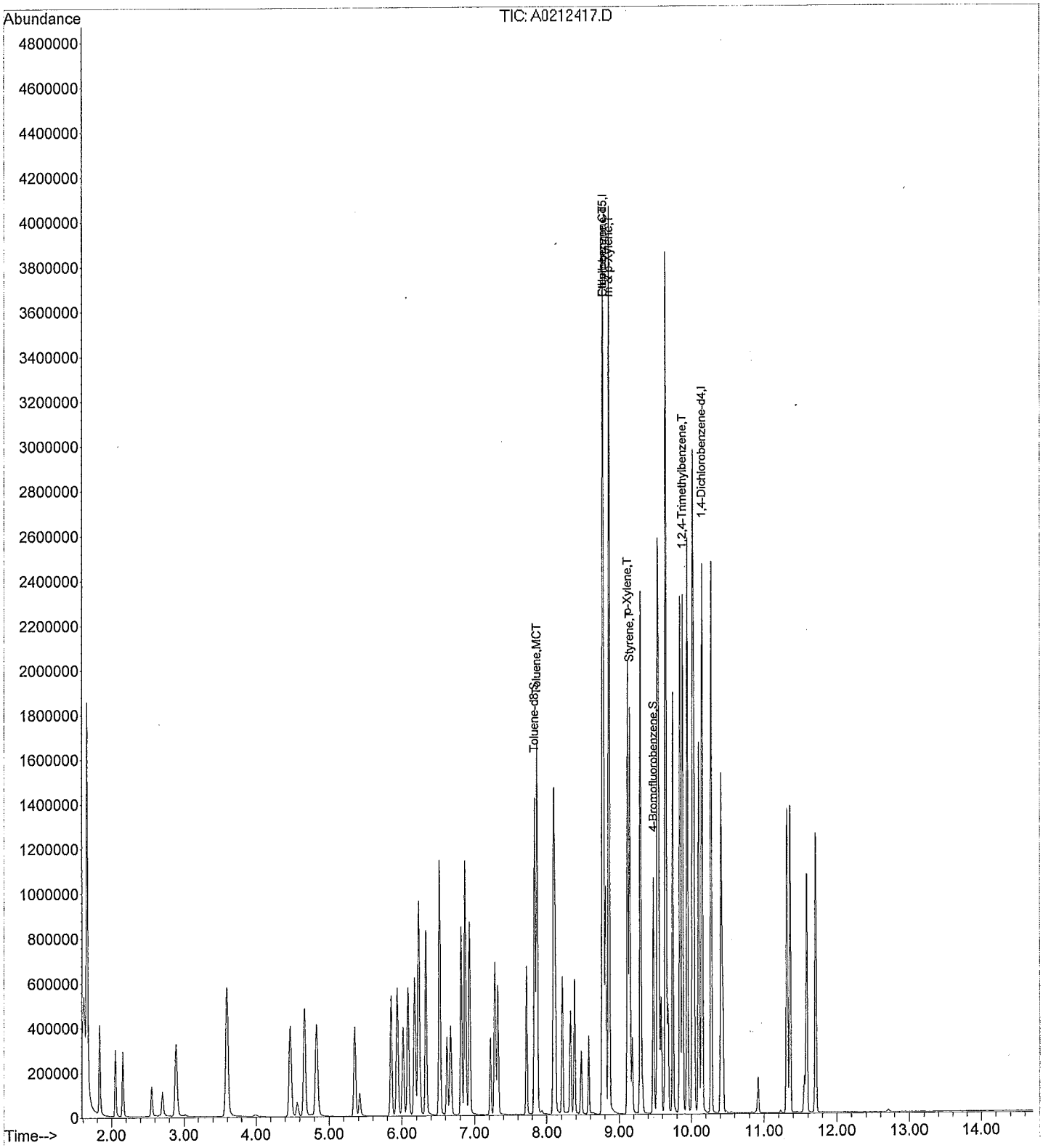
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	274744	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	270361	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	683333	137.89	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	137.89%	
9) 4-Bromofluorobenzene	9.47	95	276947	140.35	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	140.35%	
Target Compounds						Qvalue
3) Toluene	7.86	91	914534	141.58	ug/Kg	100
4) Ethylbenzene	8.78	91	1083877	142.15	ug/Kg	97
5) m & p-Xylene	8.86	91	1759378	284.25	ug/Kg	93
6) Styrene	9.14	104	678335	146.98	ug/Kg	93
7) o-Xylene	9.11	106	397346	137.00	ug/Kg	85
10) 1,2,4-Trimethylbenzene	9.87	105	1005436	145.99	ug/Kg	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212417.D
Acq On : 12 Feb 2014 7:02 pm
Operator :
Sample : VSTD125
Misc : 8260
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 20 08:39:39 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212418.D
Acq On : 12 Feb 2014 7:32 pm
Operator :
Sample : VSTD150
Misc : 8260
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 20 08:40:01 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

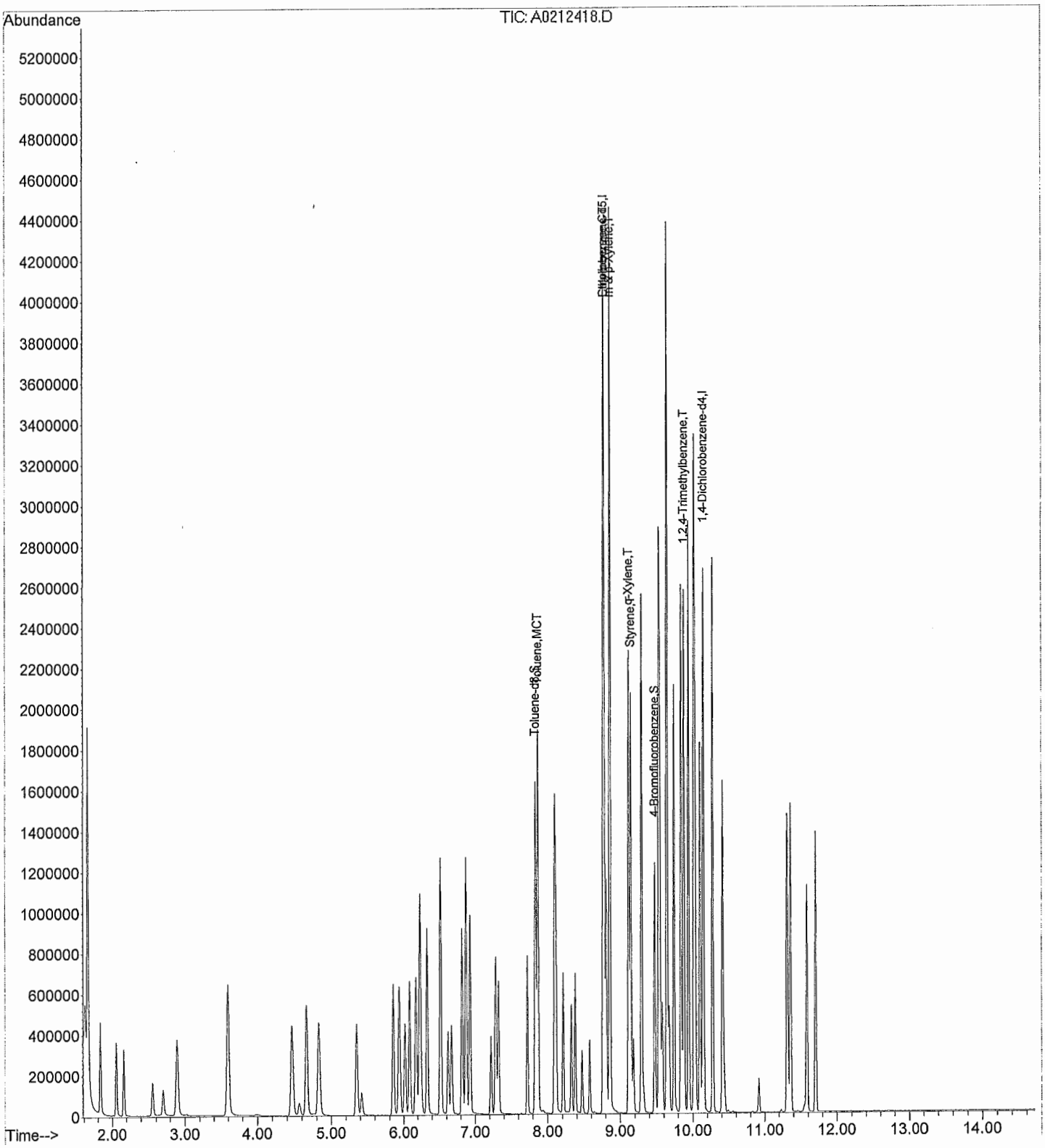
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	287555	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	272237	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	802593	154.74	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	154.74%	
9) 4-Bromofluorobenzene	9.47	95	320452	161.28	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	161.28%	
Target Compounds						Qvalue
3) Toluene	7.86	91	1022611	151.25	ug/Kg	100
4) Ethylbenzene	8.78	91	1201084	150.50	ug/Kg	97
5) m & p-Xylene	8.86	91	1953492	301.56	ug/Kg	92
6) Styrene	9.14	104	760052	157.35	ug/Kg	91
7) o-Xylene	9.11	106	443350	146.05	ug/Kg	83
10) 1,2,4-Trimethylbenzene	9.87	105	1112770	160.46	ug/Kg	91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212418.D
Acq On : 12 Feb 2014 7:32 pm
Operator :
Sample : VSTD150
Misc : 8260
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 20 08:40:01 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212419.D
Acq On : 12 Feb 2014 8:03 pm
Operator :
Sample : VSTD200
Misc : 8260
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 20 08:40:34 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration

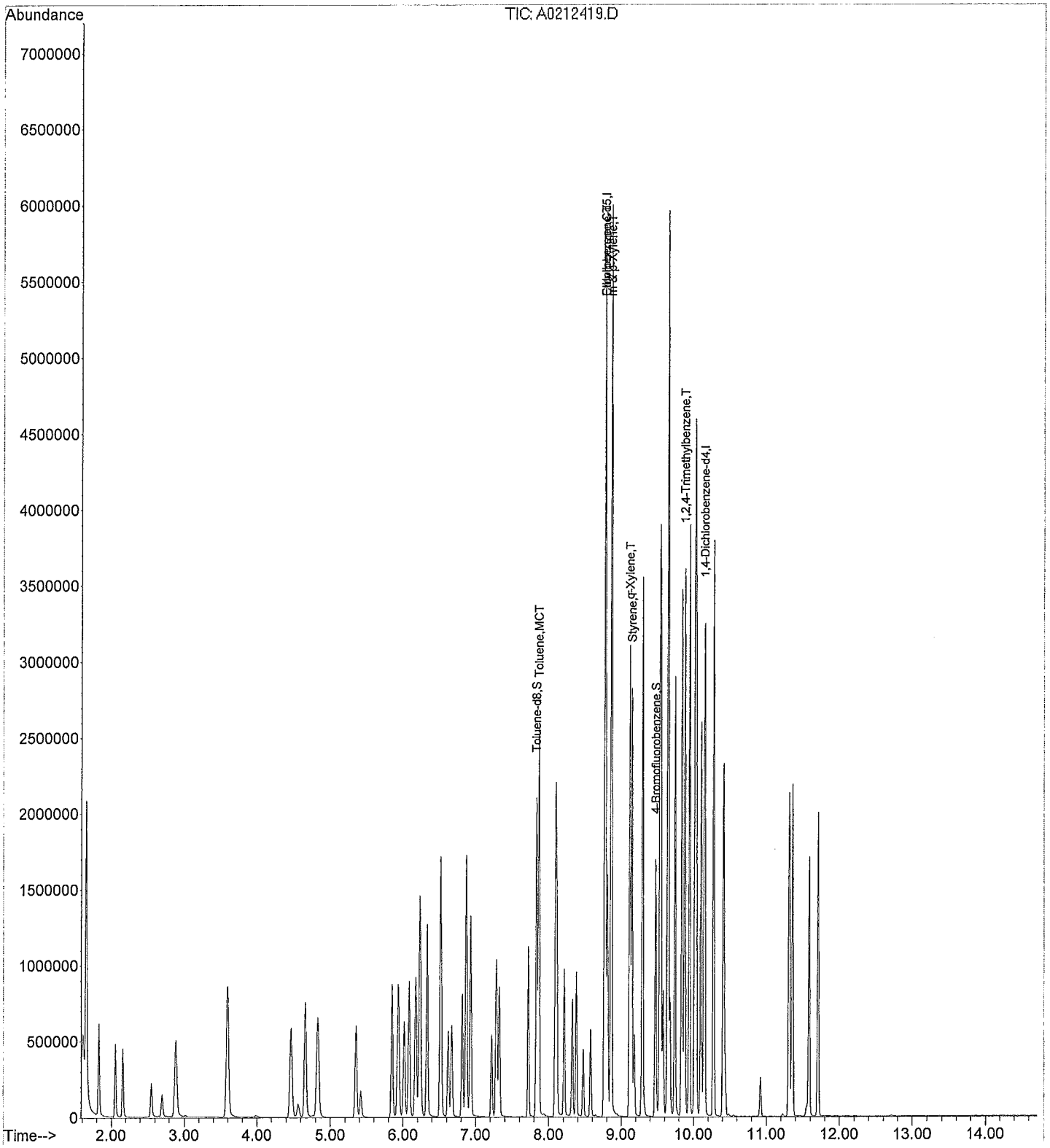
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	277381	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	270685	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	1051307	210.12	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	210.12%	
9) 4-Bromofluorobenzene	9.47	95	444587	225.04	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	225.04%	
Target Compounds						Qvalue
3) Toluene	7.86	91	1409514	216.13	ug/Kg	100
4) Ethylbenzene	8.77	91	1668416	216.73	ug/Kg	96
5) m & p-Xylene	8.86	91	2686892	429.98	ug/Kg	93
6) Styrene	9.14	104	1063677	228.28	ug/Kg	91
7) o-Xylene	9.11	106	624070	213.12	ug/Kg	85
10) 1,2,4-Trimethylbenzene	9.87	105	1550793	224.90	ug/Kg	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\021214\
Data File : A0212419.D
Acq On : 12 Feb 2014 8:03 pm
Operator :
Sample : VSTD200
Misc : 8260
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 20 08:40:34 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 08:29:00 2014
Response via : Initial Calibration



5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ARDL, Inc. Contract: ---

Lab Code: --- Case No.: 006615 SAS No.: --- SDG No.: ---

Lab File ID: A0213402 BFB Injection Date: 02/13/14

Instrument ID: AG1 BFB Injection Time: 10:53

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	17.2	
75	30.0 - 66.0% of mass 95	48.9	
95	Base Peak, 100% relative abundance	100.	
96	5.0 - 9.0% of mass 95	6.7	
173	Less than 2.0% of mass 174	0.0	(1)
174	Greater than 50.0% of mass 95	73.2	
175	4.0 - 9.0% of mass 174	7.1	(1)
176	Greater than 93.0%, but less that 101.0% of mass 174	93.7	(1)
177	5.0 - 9.0% of mass 176	6.3	(2)

(1)-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

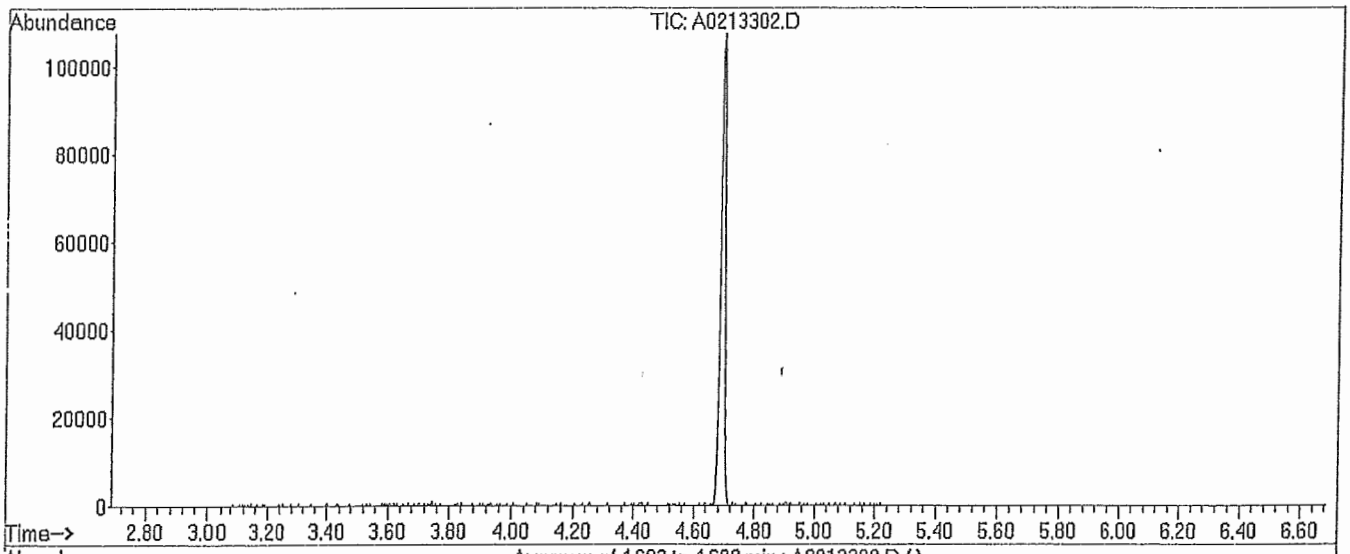
	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	ICV	100 STD	A0213404	02/13/14	12:46
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

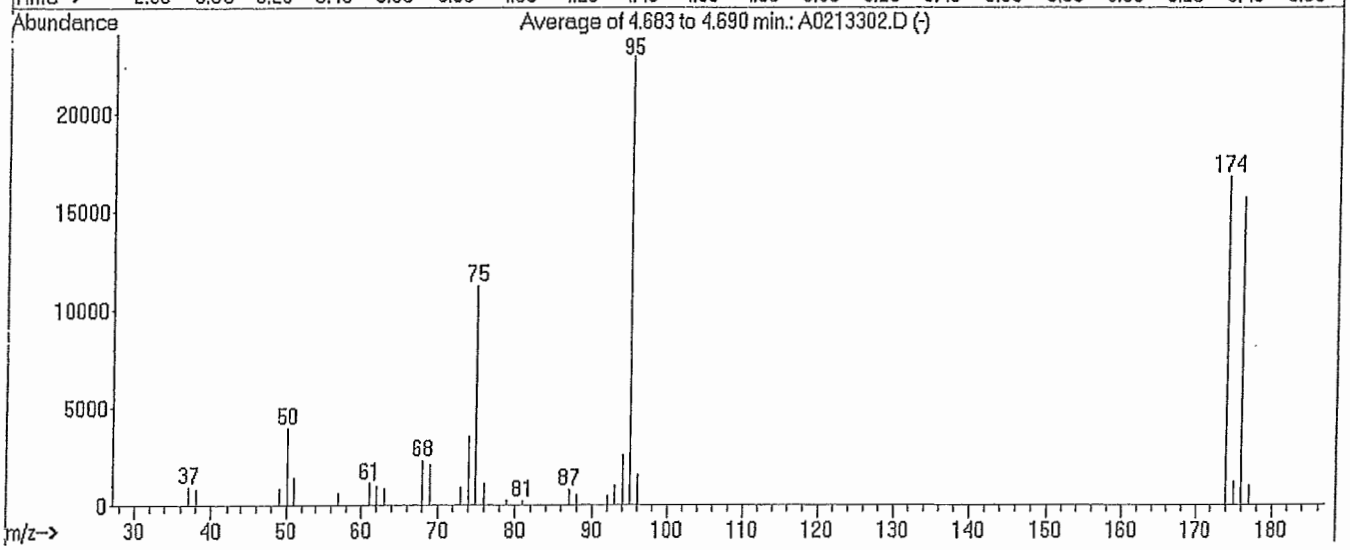
4 us 2/26/14

Data Path : C:\MSDCHEM\1\DATA\021314\
Data File : A0213302.D
Acq On : 13 Feb 2014 10:53 am
Operator :
Sample : 50 NG BFB
Misc : 8260
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\MSDCHEM\1\METHODS\BFB.M
Title :
Last Update :





AutoFind: Scans 499, 500, 501; Background Corrected with Scan 492

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.2	3951	PASS
75	95	30	66	48.9	11210	PASS
95	95	100	100	100.0	22906	PASS
96	95	5	9	6.7	1524	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	73.2	16756	PASS
175	174	4	9	7.1	1196	PASS
176	174	93	101	93.7	15700	PASS
177	176	5	9	6.3	995	PASS

rage of 4.683 to 4.690 min.: A0213302.D
NG BFB
dified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
37.05	914	73.00	896	95.00	22906		
38.10	804	74.05	3520	96.05	1524		
49.05	852	75.00	11210	173.95	16756		
50.05	3951	76.00	1102	174.95	1196		
51.05	1400	78.90	221	175.95	15700		
57.05	599	80.90	181	176.95	995		
61.05	1100	86.95	769				
62.05	961	88.00	518				
63.05	829	92.05	458				
68.00	2268	93.00	989				
69.00	2069	94.05	2562				

Continuing Calibration Report AG1

Method Path : C:\MSDCHEM\1\METHODS\
Method File : SOIL_44HI.M
Title : 8260 VOLATILES
Last Update : Thu Mar 20 09:21:05 2014
Response Via : Initial Calibration

CC Data File: A0213~~3~~4.D
4
LS 3/20/14

Min. RRF : 0.000 Min. Rel. Area : 50%
Max. RRF Dev : 20% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%
1	I	Chlorobenzene-d5	1.000	1.000	0.0	97
2	S	Toluene-d8	2.266	2.428	-7.2	100
3	MCT	Toluene	3.029	3.142	-3.7	103
4	CT	Ethylbenzene	3.654	3.676	-0.6	102
5	T	m & p-Xylene	2.960	3.083	-4.2	105
6	T	Styrene	2.217	2.314	-4.3	102
7	T	o-Xylene	1.277	1.396	-9.3	107
8	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	101
9	S	4-Bromofluorobenzene	0.951	1.002	-5.4	103
10	T	1,2,4-Trimethylbenzene	3.351	3.744	-11.7	113

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (Not Reviewed)

4 US 4/08/14

Data Path : C:\MSDCHEM\1\DATA\021314\
Data File : A0213~~8~~04.D
Acq On : 13 Feb 2014 12:46 pm
Operator :
Sample : VSTD100/ICV
Misc : 8260
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 20 09:20:58 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 09:11:30 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	270393	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	270377	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	525248	107.18 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 107.18%	
9) 4-Bromofluorobenzene	9.48	95	216816	105.37 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 105.37%	
Target Compounds					Qvalue
3) Toluene	7.86	91	679686	103.74 ug/Kg	99
4) Ethylbenzene	8.78	91	795240	100.62 ug/Kg	97
5) m & p-Xylene	8.86	91	1333941	208.33 ug/Kg	94
6) Styrene	9.15	104	500492	104.35 ug/Kg	91
7) o-Xylene	9.12	106	301959	109.30 ug/Kg	85
10) 1,2,4-Trimethylbenzene	9.88	105	809782	111.71 ug/Kg	92

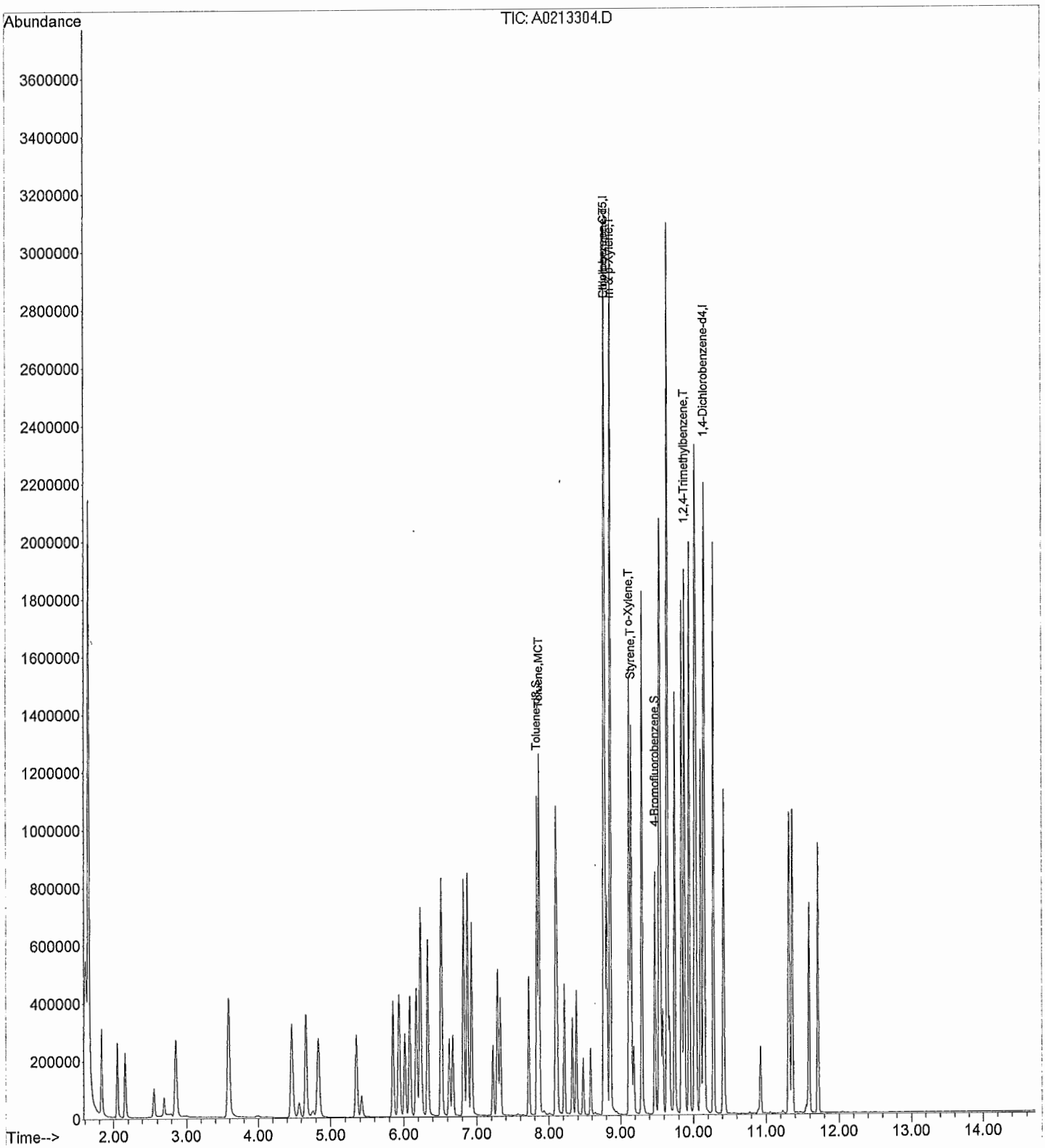
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

4 18 4/08/14

Data Path : C:\MSDCHEM\1\DATA\021314\
Data File : A0213~~3~~04.D
Acq On : 13 Feb 2014 12:46 pm
Operator :
Sample : VSTD100/ICV
Misc : 8260
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 20 09:20:58 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 09:11:30 2014
Response via : Initial Calibration



5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ARDL, Inc. Contract: ---

Lab Code: --- Case No.: 006615 SAS No.: --- SDG No.: ---

Lab File ID: A0318403 BFB Injection Date: 03/18/14

Instrument ID: AG1 BFB Injection Time: 09:29

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	16.7	
75	30.0 - 66.0% of mass 95	44.1	
95	Base Peak, 100% relative abundance	100.	
96	5.0 - 9.0% of mass 95	6.8	
173	Less than 2.0% of mass 174	0.0	(1)
174	Greater than 50.0% of mass 95	76.0	
175	4.0 - 9.0% of mass 174	7.1	(1)
176	Greater than 93.0%, but less that 101.0% of mass 174	97.6	(1)
177	5.0 - 9.0% of mass 176	7.3	(2)

(1)-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

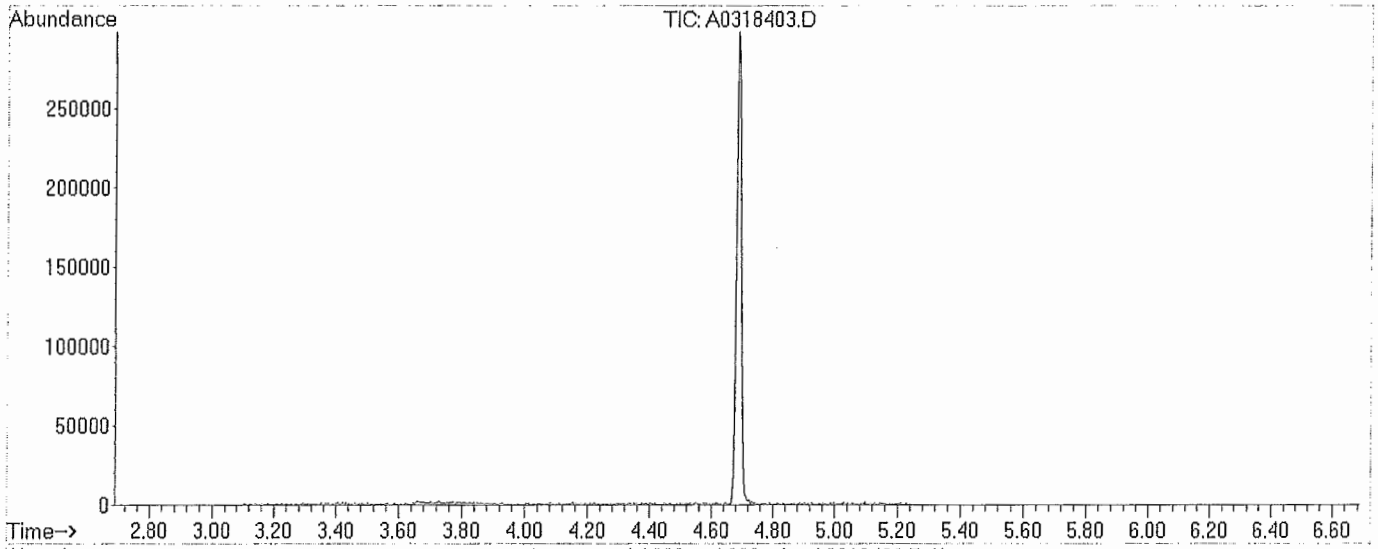
	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	VOA STD	100 STD	A0318404	03/18/14	09:57
2	SPBK 03/18/14	006615-05K1	A0318405	03/18/14	10:48
3	BLANK 03/18/14	006615-05B1	A0318406	03/18/14	11:23
4	MAK111C	006615-01	A0318407	03/18/14	12:01
5	MAK113C	006615-02	A0318408	03/18/14	12:28
6	MAK114C	006615-03	A0318409	03/18/14	12:56
7	MAK115C	006615-04	A0318410	03/18/14	13:24
8	MAK116C	006615-05	A0318411	03/18/14	13:51
9	MAK117C	006615-06	A0318412	03/18/14	14:29
10	MAK118C	006615-07	A0318413	03/18/14	14:59
11	MAK120C	006615-08	A0318414	03/18/14	15:28
12	MAK116CMS	006615-05MS	A0318415	03/18/14	15:58
13	MAK116CMSD	006615-05MD	A0318416	03/18/14	16:27
14					
15					
16					
17					
18					
19					
20					
21					
22					

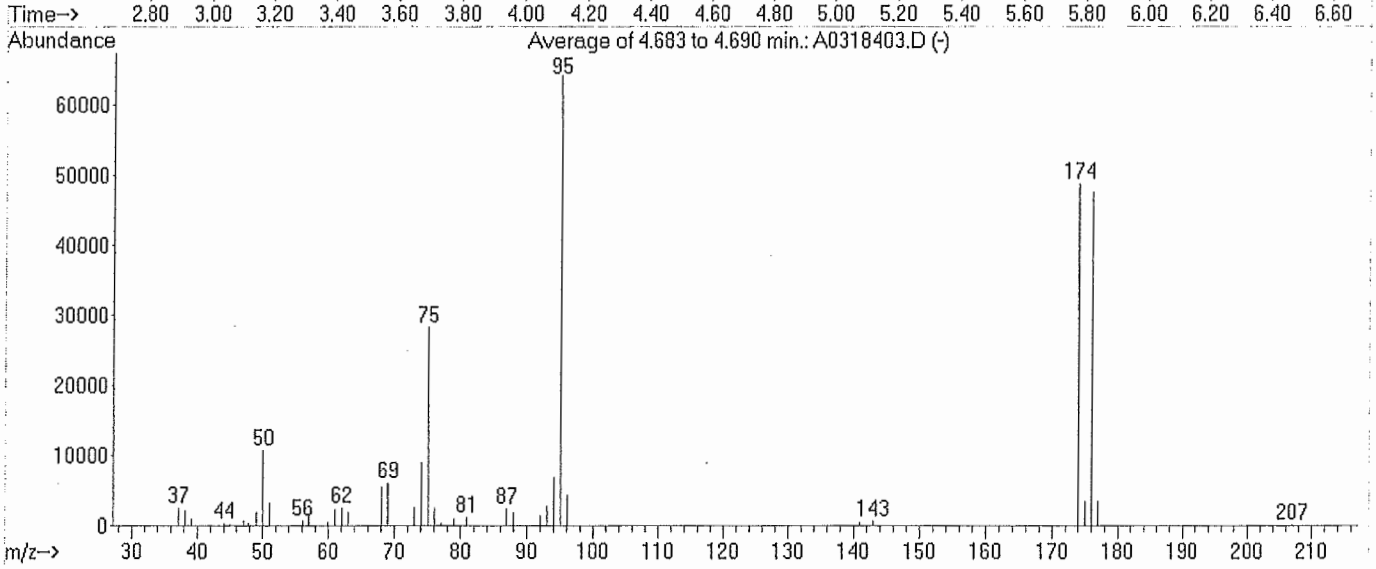
BFB

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318403.D
Acq On : 18 Mar 2014 9:29 am
Operator :
Sample : 50 NG BFB
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\MSDCHEM\1\METHODS\BFBSOIL.M
Title :
Last Update :





AutoFind: Scans 499, 500, 501; Background Corrected with Scan 491

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	16.7	10740	PASS
75	95	30	66	44.1	28272	PASS
95	95	100	100	100.0	64176	PASS
96	95	5	9	6.8	4344	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	76.0	48778	PASS
175	174	4	9	7.1	3465	PASS
176	174	93	101	97.6	47621	PASS
177	176	5	9	7.3	3493	PASS

Average of 4.683 to 4.690 min.: A0318403.D
50 NG BFB
Modified:subtracted

m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
37.10	2581	56.05	752	76.05	2613	140.90	466
38.15	2163	57.05	1351	77.05	348	142.95	680
39.10	940	59.95	475	78.95	1040	174.00	48778
44.00	383	61.05	2352	80.95	1192	175.00	3465
45.00	191	62.05	2569	86.95	2452	176.00	47621
47.10	722	63.05	1980	88.00	1915	176.95	3493
47.85	376	68.05	5566	92.00	1485	207.00	168
48.10	171	69.05	6076	93.00	2775		
49.05	1970	73.00	2629	94.00	6913		
50.05	10740	74.05	8990	95.05	64176		
51.05	3300	75.05	28272	96.05	4344		

Continuing Calibration Report AG1

Method Path : C:\MSDCHEM\1\METHODS\
Method File : SOIL_44HI.M
Title : 8260 VOLATILES
Last Update : Thu Mar 20 11:52:08 2014
Response Via : Initial Calibration

CC Data File: A0318404.D

Min. RRF : 0.000 Min. Rel. Area : 50%
Max. RRF Dev : 20% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%
1	I	Chlorobenzene-d5	1.000	1.000	0.0	121
2	S	Toluene-d8	2.266	2.270	-0.2	117
3	MCT	Toluene	3.029	3.137	-3.6	129
4	CT	Ethylbenzene	3.654	3.745	-2.5	130
5	T	m & p-Xylene	2.960	2.971	-0.4	127
6	T	Styrene	2.217	2.304	-3.9	127
7	T	o-Xylene	1.277	1.348	-5.6	129
8	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	121
9	S	4-Bromofluorobenzene	0.951	0.907	4.6	112
10	T	1,2,4-Trimethylbenzene	3.351	3.435	-2.5	124

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318404.D
Acq On : 18 Mar 2014 9:57 am
Operator :
Sample : VSTD100
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 20 11:49:34 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

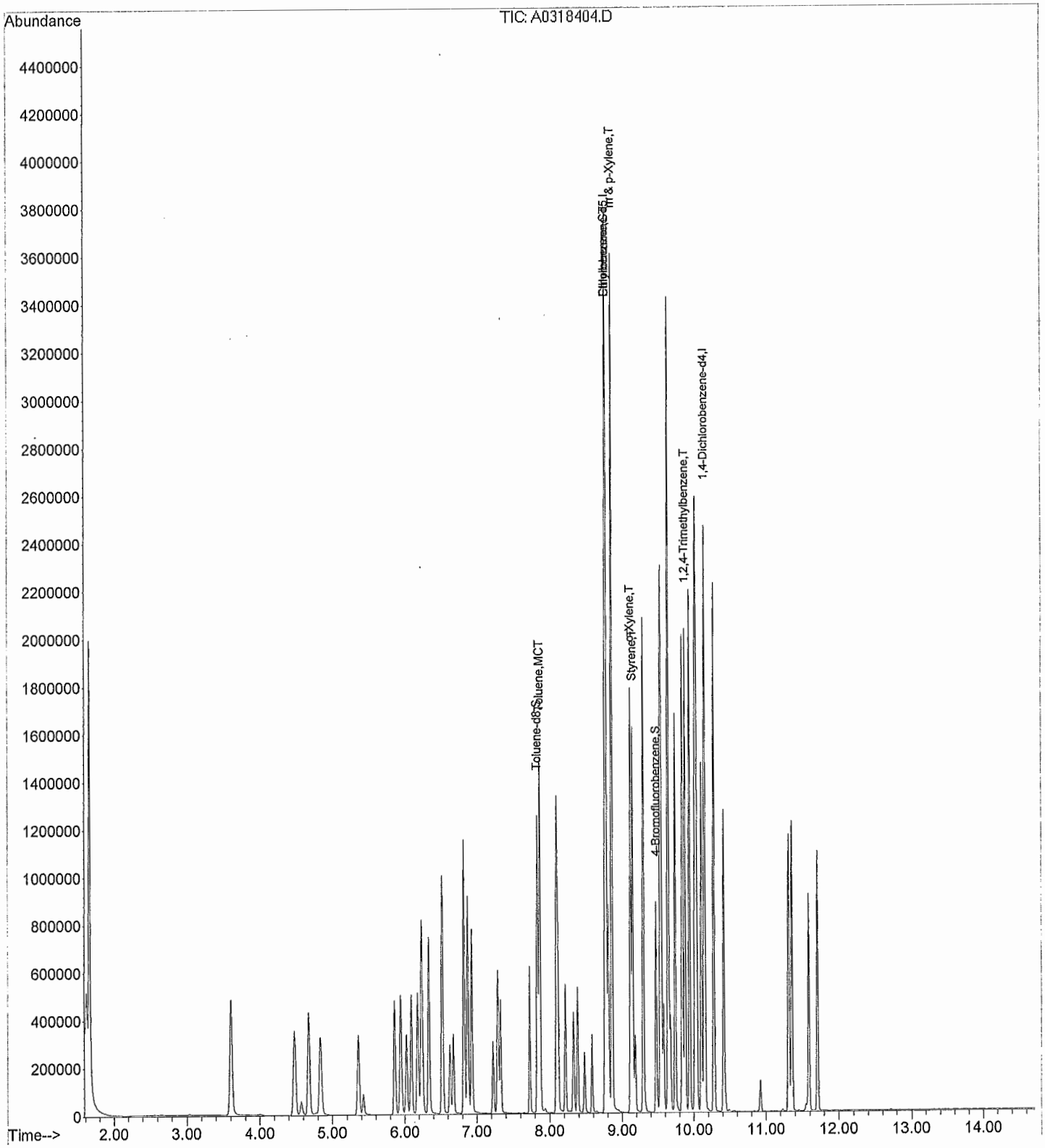
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	338007	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	324055	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.84	98	613932	100.21	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	100.21%	
9) 4-Bromofluorobenzene	9.48	95	235189	95.37	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	95.37%	
Target Compounds						Qvalue
3) Toluene	7.87	91	848251	103.57	ug/Kg	100
4) Ethylbenzene	8.78	91	1012648	102.50	ug/Kg	97
5) m & p-Xylene	8.86	91	1606579	200.72	ug/Kg	94
6) Styrene	9.15	104	623115	103.93	ug/Kg	95
7) o-Xylene	9.12	106	364638	105.59	ug/Kg	86
10) 1,2,4-Trimethylbenzene	9.88	105	890450	102.49	ug/Kg	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318404.D
Acq On : 18 Mar 2014 9:57 am
Operator :
Sample : VSTD100
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 20 11:49:34 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



Instrument Logs/
Analysis Notebook Pages

Rev. 1.1

Run Method = SOIL_24.M
Tune = BFBSOIL.U EM = 1887
Telemar = NB 3167 pg. 34
Quant Method = SOIL_42B

8	1	A0212408.d	0.	50 NG BFB (2uL - X1007) Pass	8260	
9	1	A0212409.d	0.	VSTD000	8260	
10	2	A0212410.d	0.	VSTD000	8260	Conc for SOIL_44HI
11	3	A0212411.d	0.	VSTD000 - Pass	8260	
12	4	A0212412.d	0.	VSTD005	8260	~~- VSTD12.5~~
13	5	A0212413.d	0.	VSTD010	8260	- VSTD025
14	6	A0212414.d	0.	VSTD020	8260	- VSTD050
15	7	A0212415.d	0.	VSTD030	8260	- VSTD075
16	8	A0212416.d	0.	VSTD040 SOIL_43	8260	~~- VSTD100~~
17	9	A0212417.d	0.	VSTD050	8260	- VSTD125
18	10	A0212418.d	0.	VSTD060	8260	- VSTD150
19	11	A0212419.d	0.	VSTD080	8260	~~- VSTD200~~
20	12	A0212420.d	0.	FLUSH	8260	
21	13	A0212421.d	0.	VSTD005 Not Needed	8260	
22	14	A0212422.d	0.	VSTD030 ⊥	8260	

US 2/26/14

	ISTD X1023	Sur X1024	IC Mix X1025	Gases (Abs) X1026
VSTD005	5uL	0.5uL	0.25uL	0.5uL
10		1	0.5	1
20		2	1	2
30		3	1.5	3
40		4	2	4
50		5	2.5	5
60		6	3	6
80	⊥	8	4	8

Not calibrated for: Chloroethane, Acetone, Methylene Chloride

Changed quant ion for O-xylene (91 to 106) for Limu tissue analysis only. Standards were adjusted for 2g analysis of tissue samples and saved as SOIL_44HI

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
US	2/13/14	GRC	2/26/14

PROJECT 2/13/14 AG1 SOIL

Run Method = SOIL_24.M
Tune = BFBSOIL.U EM = 1882
Quant Method = SOIL_43

5ul - ISTD = X1023
4ul - Sur = X1024

Injection Log

Directory: C:\MSDCHEM\1\DATA\021314

Line	Vial	FileName	Multiplier	SampleName	Misc Info	
1	1	A0213301.d	0.	FLUSH	8260	Conc. for SOIL_43
2	1	A0213302.d	0.	50 NG BFB (2ul-X1007) - Pass 10:53am	8260	
3	1	A0213303.d	0.	VSTD040/ICV C#5	8260	— VSTD040
4	1	A0213304.d	0.	VSTD040/ICV - Pass	8260	— VSTD040
5	1	A0213305.d	0.	VSTD000	8260	
6	1	A0213306.d	0.	VSTD000	8260	
7	1	A0213407.d	0.	VSTD000	8260	
8	2	A0213408.d	0.	LOD 1	8260	
9	3	A0213409.d	0.	LOD 1	8260	
10	4	A0213410.d	0.	LOD 2	8260	
11	5	A0213411.d	0.	LOD 2	8260	
12	6	A0213412.d	0.	LOQ 1 > spiked wrong - RE	8260	
13	7	A0213413.d	0.	LOQ 1	8260	
14	8	A0213414.d	0.	VSTD040	8260	

LS 2/20/14

LS 2/20/14

LOD 1 = 5ul-X1023; 0.1ul-X1024; 20ul-X1029; 0.1ul-X1026

LOD 2 = 5ul-X1023; 0.2ul-X1024; 40ul-X1029; 0.2ul-X1026

LOQ 1 = 5ul-X1023; 0.5ul-X1024; 1ul-X1025; 0.5ul-X1026

ICV = 5ul-X1023; 4ul-X1024; 8ul-X1027; 4ul-X1028

LS 2/14/14

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
LS	2/14/14	TRC	2/26/14

Run Method= SOIL_24.M
Tune=BFBSOIL.u EM=1882
Telmar= NB 3167 pg. 34
Quant Method= SOIL_~~43HI~~ ~~43I~~ 44HI
US 3/20/14

5ul-ISTD= X1053
4ul-Surr = X1054
15ul - Anti Foam Agent X1040

A0318401.D FLUSH
02.D FLUSH
03.D 50 NG BFB (2ul-X1007) Pass 9:29 am
04.D VSTD040 100 US 3/20/14 Pass
2ul-X1064
05.D LCS Pass
8ul-X1063
06.D VSTD000 Pass
07.D 006615-01 MAK111C (2.02g) Pass
08.D 006615-02 MAK113C (2.01g) Pass
09.D 006615-03 MAK114C (2.02g) Pass
10.D 006615-04 MAK115C (1.99g) Pass
11.D 006615-05 MAK116C (1.98g) Pass
12.D 006615-06 MAK117C (1.99g) Pass
13.D 006615-07 MAK118C (1.98g) Pass
14.D 006615-08 MAK120C (2.01g) Pass
15.D 006615-05MS MAK111CMS (1.99g) Pass
same as 05.D
16.D 006615-05MD MAK111CMSD (2.01g) Pass
same as 05.D
17.D VSTD040 100 US 3/20/14 Pass 5:03 pm
same as 04.D
18.D VSTD040 100 US 3/20/14 Not evaluated
same as 04.D

US
3/19/14

Continued on Page

Read and Understood By

US Signed | 3/19/14 Date | Signed | 3/19/14 Date

Blank / Field Sample / QC Data

Sample Results

Chromatogram

Quant Report (If applicable)

Confirmation Analysis Quant Report / Chromatogram (If applicable)

Tentatively Identified Compounds (If required)

Rev. 1.1

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	NA	ARDL Lab No.:	006615-05K1
Desc/Location:	NA	Lab Filename:	A0318405
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	03/18/2014
Matrix:	QC Material	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units
Toluene	2.50	12.5	89.4		UG/KG
Ethyl Benzene	2.50	12.5	85.6		UG/KG
m & p-Xylene	5.00	25.0	171		UG/KG
Styrene	2.50	12.5	85.2		UG/KG
o-Xylene	2.50	12.5	87.4		UG/KG
1,2,4-Trimethylbenzene	2.50	12.5	91.9		UG/KG

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	102%
4-Bromofluorobenzene	50-150	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Spike Blank for Run 0321JFSM, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318405.D
Acq On : 18 Mar 2014 10:48 am
Operator :
Sample : LCS 006615-05K1
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1 JJS 03/21/14

Quant Time: Mar 20 11:49:43 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

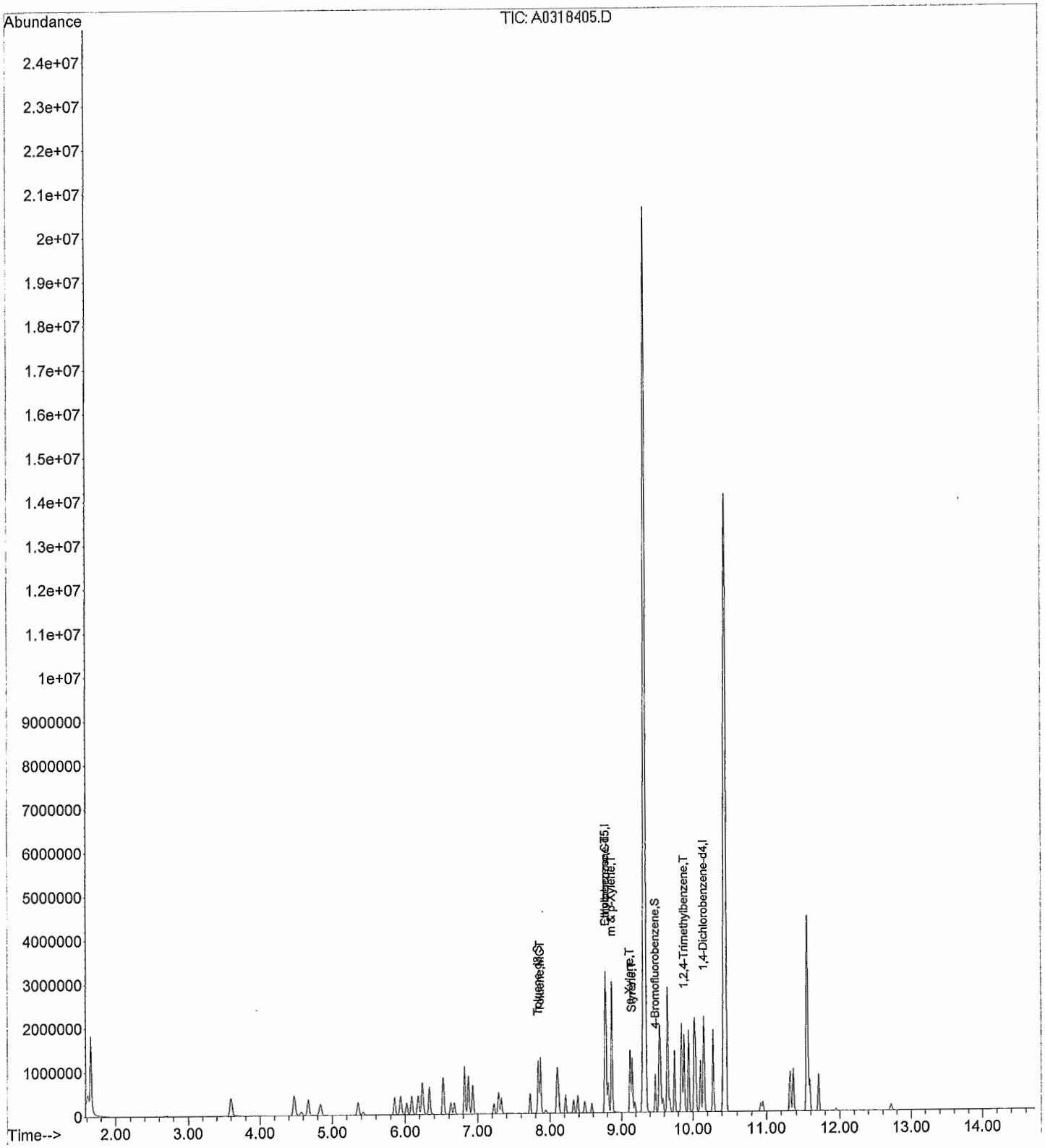
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	317981	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	309346	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.84	98	587878	102.00	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	102.00%	
9) 4-Bromofluorobenzene	9.48	95	230209	97.79	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	97.79%	
Target Compounds						Qvalue
3) Toluene	7.87	91	688454	89.35	ug/Kg	100
4) Ethylbenzene	8.78	91	795316	85.57	ug/Kg	97
5) m & p-Xylene	8.86	91	1289480	171.25	ug/Kg	94
6) Styrene	9.15	104	480604	85.21	ug/Kg	93
7) o-Xylene	9.12	106	283796	87.35	ug/Kg	87
10) 1,2,4-Trimethylbenzene	9.88	105	762250	91.91	ug/Kg	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318405.D
Acq On : 18 Mar 2014 10:48 am
Operator :
Sample : LCS 006615-05K1
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1 03/21/14

Quant Time: Mar 20 11:49:43 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



METHOD BLANK REPORT
ARDL, Inc. 400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	NA	ARDL Lab No.:	006615-05B1
Desc/Location:	NA	Lab Filename:	A0318406
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	03/18/2014
Matrix:	QC Material	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	NA	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units
Toluene	2.50	12.5	ND		UG/KG
Ethyl Benzene	2.50	12.5	ND		UG/KG
m & p-Xylene	5.00	25.0	ND		UG/KG
Styrene	2.50	12.5	ND		UG/KG
o-Xylene	2.50	12.5	ND		UG/KG
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	103%
4-Bromofluorobenzene	50-150	102%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Blank for Run 0321JFSM, VOLATILES, GC/MS (8260)

Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318406.D
Acq On : 18 Mar 2014 11:23 am
Operator :
Sample : ~~VSTD000~~ 006615-05B1
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1 JAS 03/21/14

Quant Time: Mar 20 11:53:05 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	301422	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	301153	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.84	98	564202	103.27	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	103.27%	
9) 4-Bromofluorobenzene	9.48	95	233087	101.70	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	101.70%	

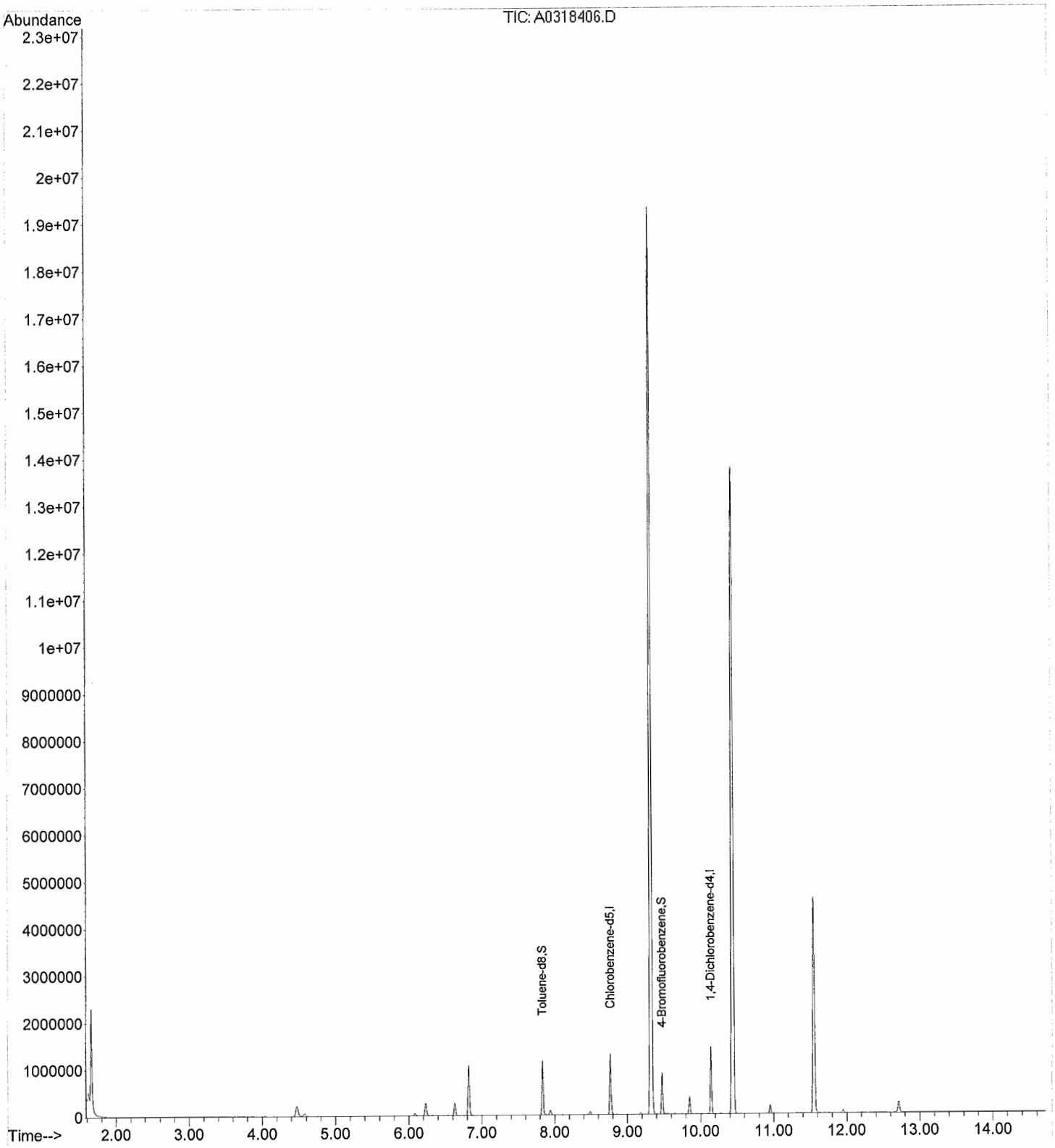
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318406.D
Acq On : 18 Mar 2014 11:23 am
Operator :
Sample : ~~VSTD000~~ 006615-05B1
Misc : 8260 SOIL
ALS Vial : 1 Sample Multiplier: 1 03/21/14

Quant Time: Mar 20 11:53:05 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 111C	ARDL Lab No.:	006615-01
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318407
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1000	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	99%
4-Bromofluorobenzene	50-150	92%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-01, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318407.D
Acq On : 18 Mar 2014 12:01 pm
Operator :
Sample : 006615-01
Misc : 8260 SOIL MAK111C (2.02g)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 20 11:50:02 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	315050	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	349959	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	565094	98.96	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 98.96%			
9) 4-Bromofluorobenzene	9.48	95	245126	92.04	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 92.04%			

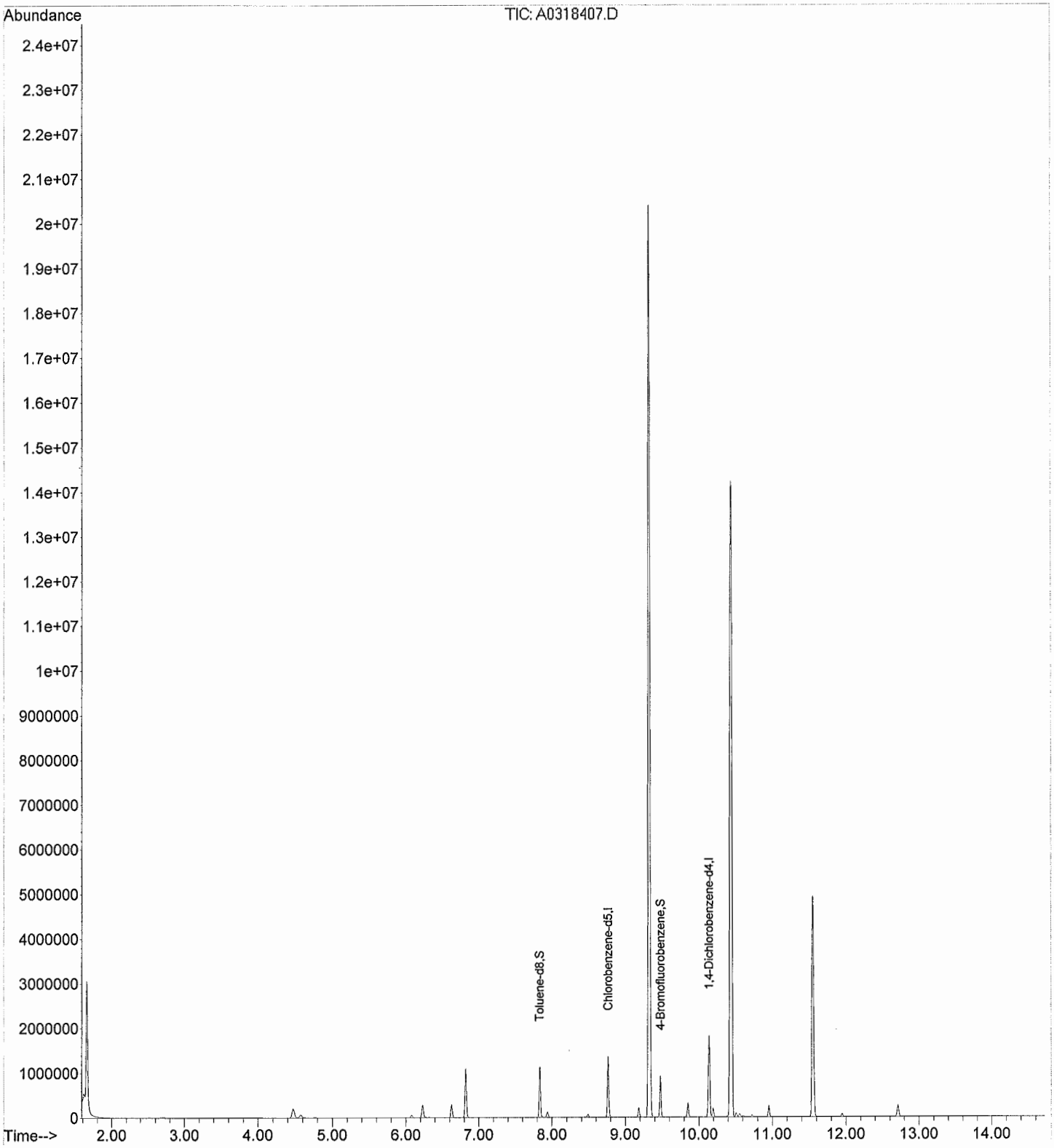
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318407.D
Acq On : 18 Mar 2014 12:01 pm
Operator :
Sample : 006615-01
Misc : 8260 SOIL MAK111C (2.02g)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 20 11:50:02 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 113C	ARDL Lab No.:	006615-02
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318408
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1120	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	98%
4-Bromofluorobenzene	50-150	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318408.D
Acq On : 18 Mar 2014 12:28 pm
Operator :
Sample : 006615-02
Misc : 8260 SOIL MAK113C (2.01g)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 20 11:50:09 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	301008	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	312715	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	532092	97.53 ug/Kg	0.00
Spiked Amount 100.000			Recovery =	97.53%	
9) 4-Bromofluorobenzene	9.48	95	232558	97.72 ug/Kg	0.00
Spiked Amount 100.000			Recovery =	97.72%	

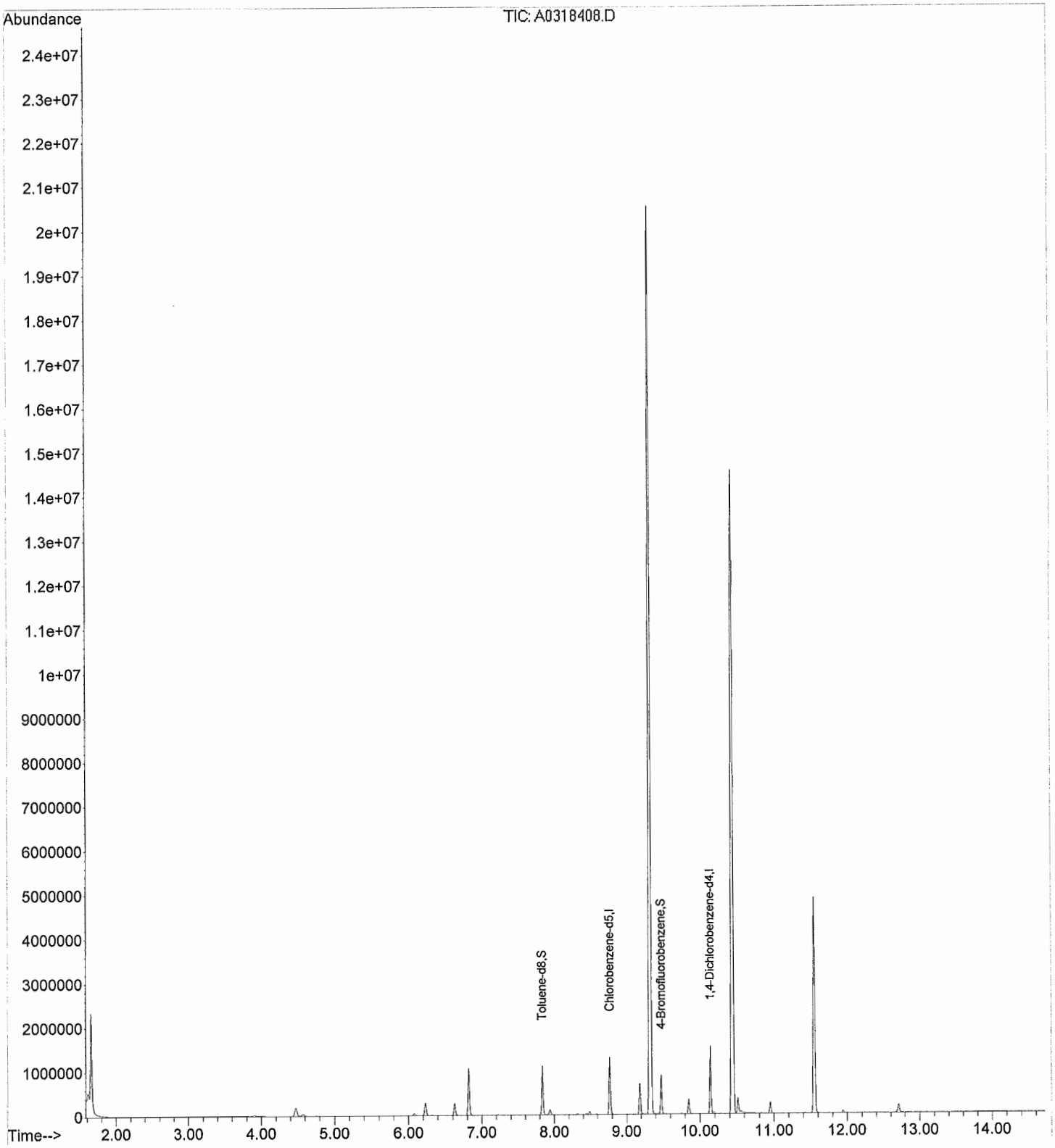
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318408.D
Acq On : 18 Mar 2014 12:28 pm
Operator :
Sample : 006615-02
Misc : 8260 SOIL MAK113C (2.01g)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 20 11:50:09 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 114C	ARDL Lab No.:	006615-03
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318409
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1155	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	97%
4-Bromofluorobenzene	50-150	97%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-03, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318409.D
Acq On : 18 Mar 2014 12:56 pm
Operator :
Sample : 006615-03
Misc : 8260 SOIL MAK114C (2.02g)
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 20 11:50:15 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	296444	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	322280	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	519099	96.61 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 96.61%	
9) 4-Bromofluorobenzene	9.48	95	238908	97.41 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 97.41%	

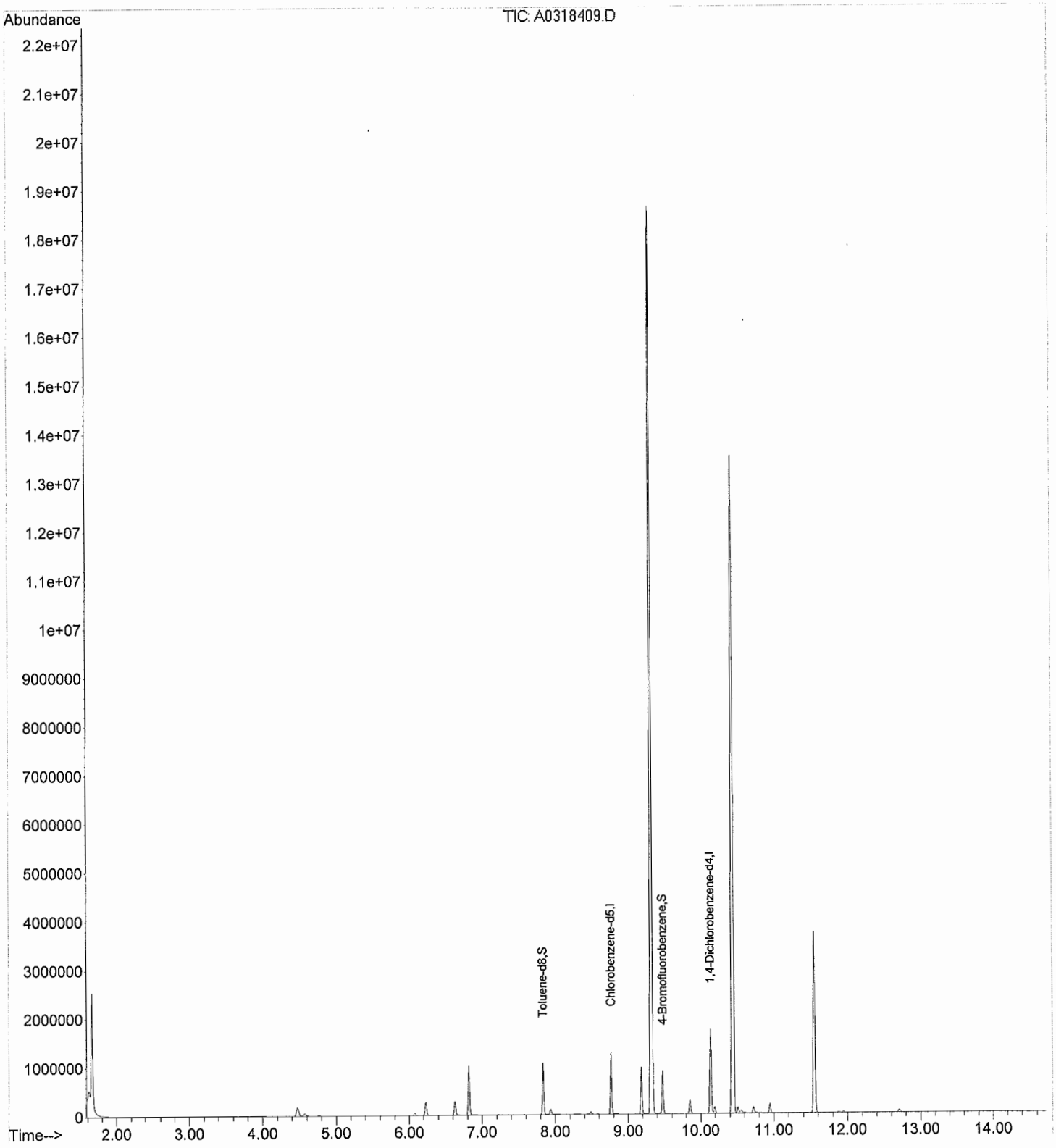
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318409.D
Acq On : 18 Mar 2014 12:56 pm
Operator :
Sample : 006615-03
Misc : 8260 SOIL MAK114C (2.02g)
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 20 11:50:15 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 115C	ARDL Lab No.:	006615-04
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318410
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1300	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	100%
4-Bromofluorobenzene	50-150	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318410.D
Acq On : 18 Mar 2014 1:24 pm
Operator :
Sample : 006615-04
Misc : 8260 SOIL MAK115C (1.99g)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 20 11:50:21 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	281950	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	320073	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	512183	100.23	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	100.23%	
9) 4-Bromofluorobenzene	9.47	95	231053	94.86	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	94.86%	

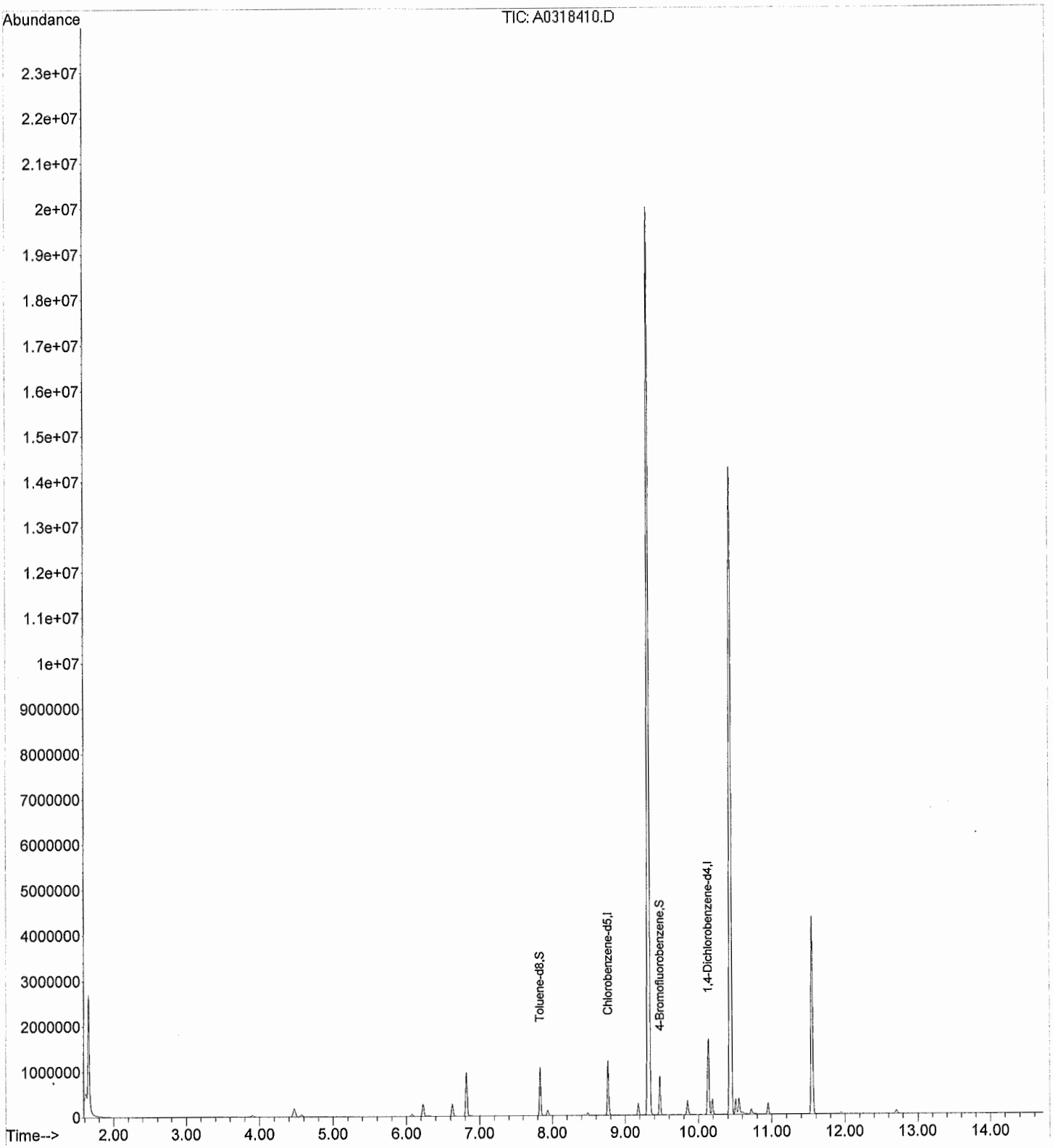
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318410.D
Acq On : 18 Mar 2014 1:24 pm
Operator :
Sample : 006615-04
Misc : 8260 SOIL MAK115C (1.99g)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 20 11:50:21 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 116C	ARDL Lab No.:	006615-05
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318411
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1330	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	99%
4-Bromofluorobenzene	50-150	98%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-05, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318411.D
Acq On : 18 Mar 2014 1:51 pm
Operator :
Sample : 006615-05
Misc : 8260 SOIL MAK116C (1.98g)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 20 11:50:27 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.77	82	276589	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	301387	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	496944	99.13	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 99.13%			
9) 4-Bromofluorobenzene	9.47	95	223785	97.57	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 97.57%			

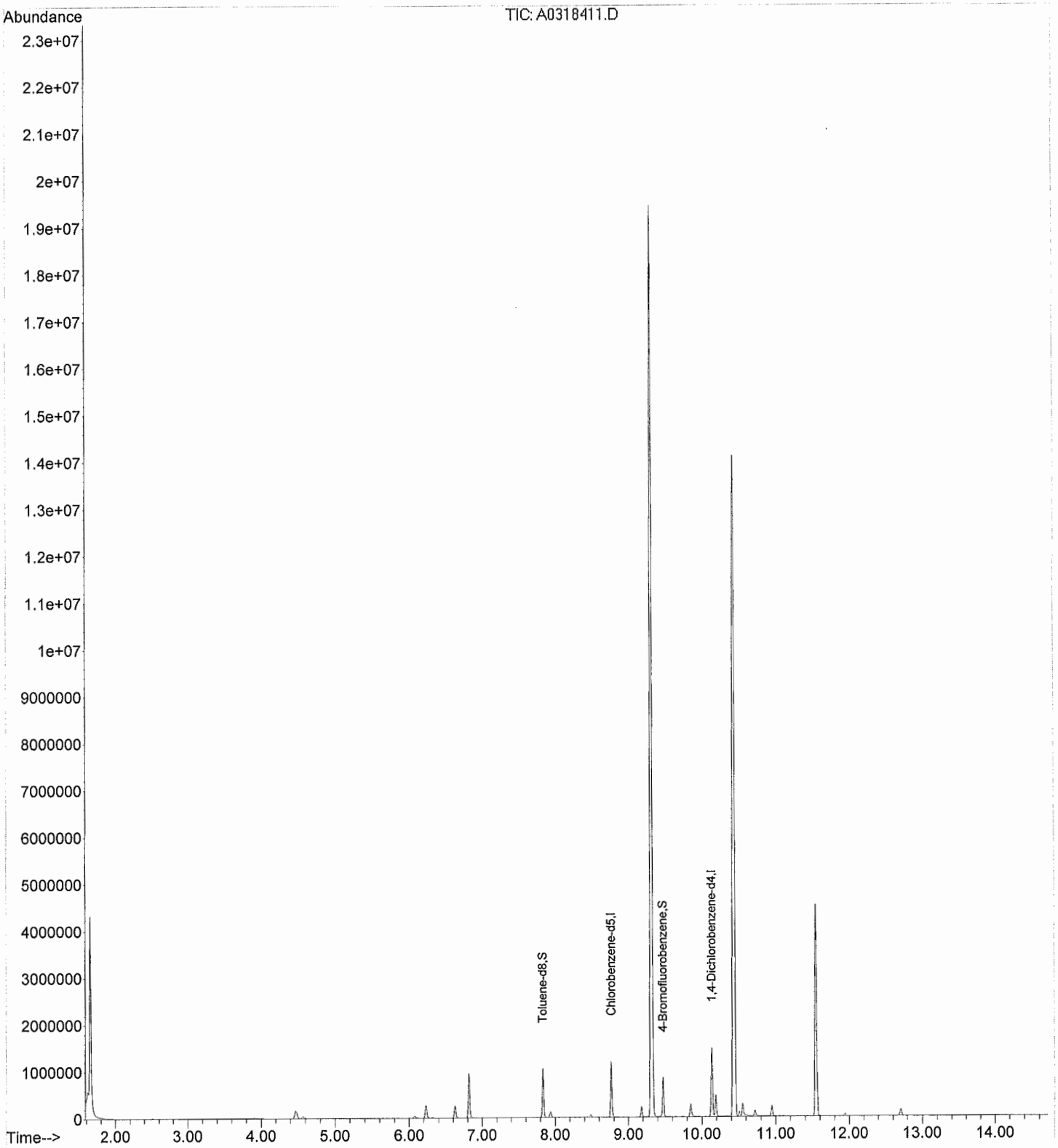
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318411.D
Acq On : 18 Mar 2014 1:51 pm
Operator :
Sample : 006615-05
Misc : 8260 SOIL MAK116C (1.98g)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 20 11:50:27 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 116C	ARDL Lab No.:	006615-05MS
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318415
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1330	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	98.2		UG/KG	1
Ethyl Benzene	2.50	12.5	95.5		UG/KG	1
m & p-Xylene	5.0	25.0	191		UG/KG	1
Styrene	2.50	12.5	101		UG/KG	1
o-Xylene	2.50	12.5	99.2		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	101		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	96%
4-Bromofluorobenzene	50-150	96%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Matrix Spike for 006615-05, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318415.D
Acq On : 18 Mar 2014 3:58 pm
Operator :
Sample : 006615-05MS
Misc : 8260 SOIL MAK116CMS (1.99g)
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 20 11:51:00 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

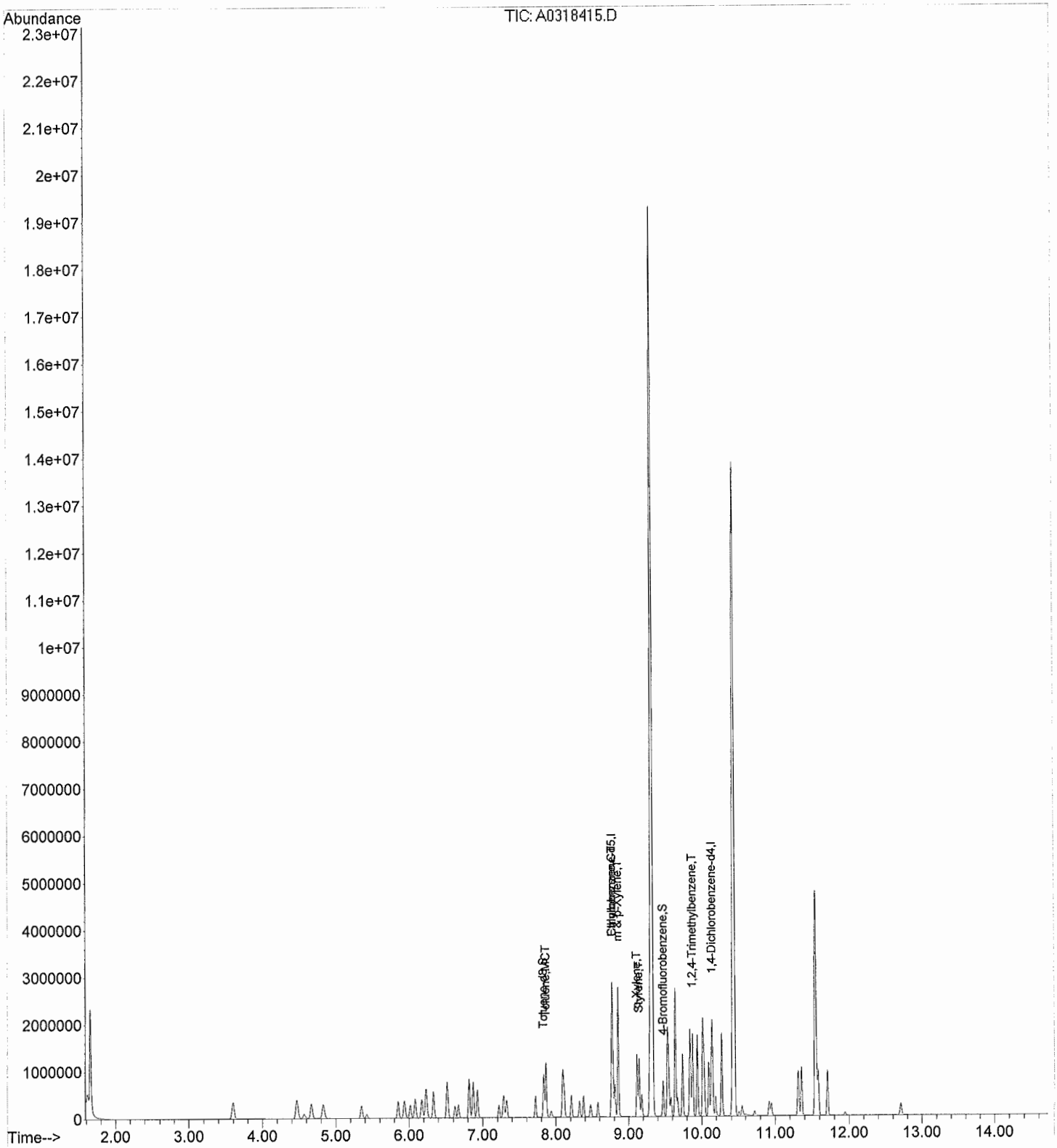
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	260269	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	271420	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	453182	96.07	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 96.07%			
9) 4-Bromofluorobenzene	9.47	95	197903	95.81	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 95.81%			
Target Compounds						Qvalue
3) Toluene	7.86	91	619323	98.20	ug/Kg	100
4) Ethylbenzene	8.78	91	726372	95.48	ug/Kg	97
5) m & p-Xylene	8.86	91	1177790	191.10	ug/Kg	94
6) Styrene	9.15	104	465334	100.79	ug/Kg	92
7) o-Xylene	9.11	106	263762	99.19	ug/Kg	85
10) 1,2,4-Trimethylbenzene	9.87	105	734915	100.99	ug/Kg	93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318415.D
Acq On : 18 Mar 2014 3:58 pm
Operator :
Sample : 006615-05MS
Misc : 8260 SOIL MAK116CMS (1.99g)
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 20 11:51:00 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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Mt. Vernon, Illinois 62864

Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 116C	ARDL Lab No.:	006615-05MD
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318416
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1330	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	106		UG/KG	1
Ethyl Benzene	2.50	12.5	103		UG/KG	1
m & p-Xylene	5.0	25.0	205		UG/KG	1
Styrene	2.50	12.5	107		UG/KG	1
o-Xylene	2.50	12.5	107		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	106		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	106%
4-Bromofluorobenzene	50-150	102%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Matrix Spike Duplicate for 006615-05, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318416.D
Acq On : 18 Mar 2014 4:27 pm
Operator :
Sample : 006615-05MD
Misc : 8260 SOIL MAK116CMSD (2.01g)
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 20 11:51:05 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

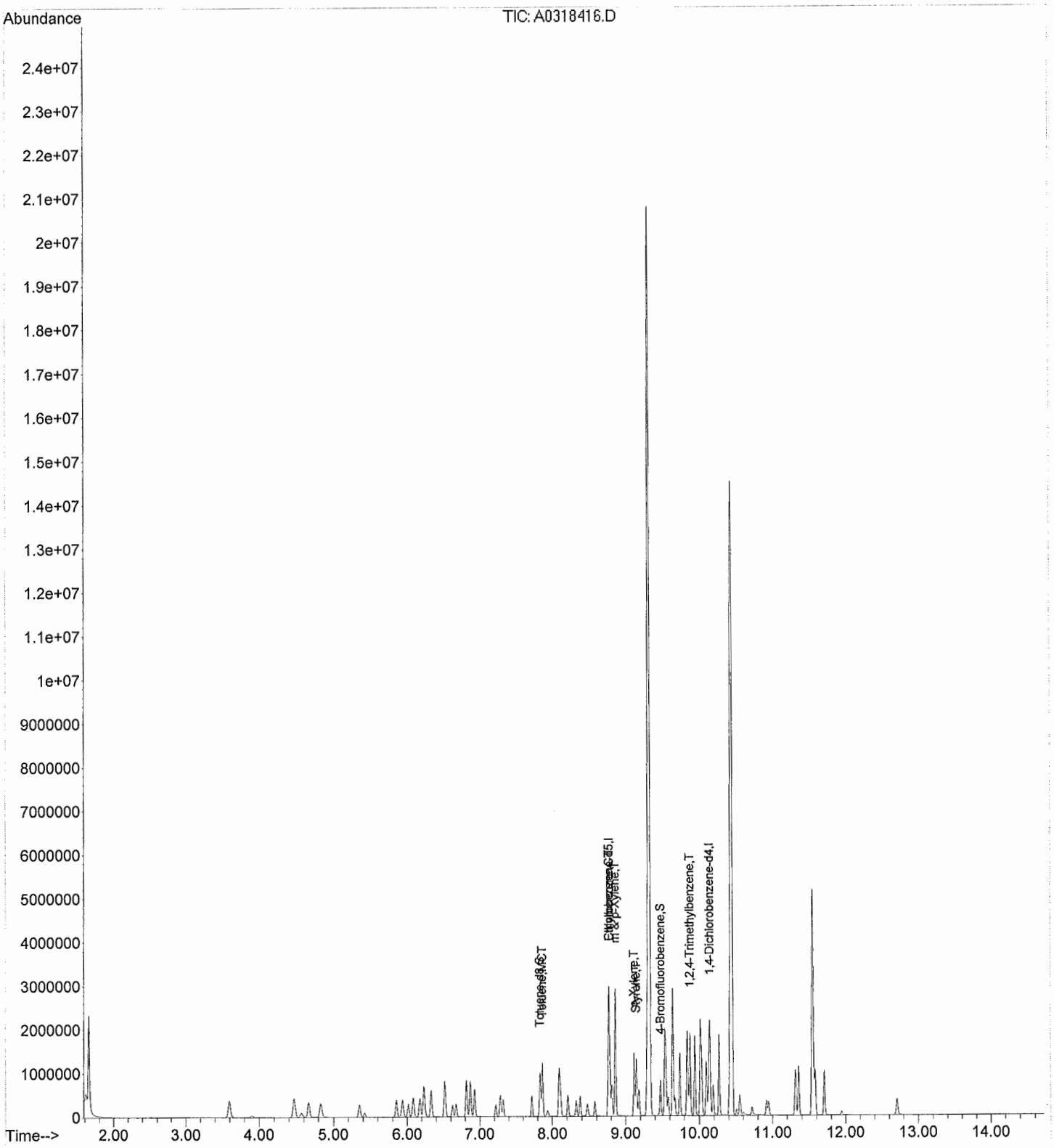
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	258983	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	275578	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	495649	105.59 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 105.59%	
9) 4-Bromofluorobenzene	9.47	95	213000	101.56 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 101.56%	
Target Compounds					Qvalue
3) Toluene	7.86	91	666177	106.16 ug/Kg	99
4) Ethylbenzene	8.77	91	782168	103.32 ug/Kg	98
5) m & p-Xylene	8.86	91	1260008	205.45 ug/Kg	95
6) Styrene	9.14	104	491448	106.98 ug/Kg	93
7) o-Xylene	9.11	106	283456	107.13 ug/Kg	89
10) 1,2,4-Trimethylbenzene	9.87	105	781596	105.79 ug/Kg	93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318416.D
Acq On : 18 Mar 2014 4:27 pm
Operator :
Sample : 006615-05MD
Misc : 8260 SOIL MAK116CMSD (2.01g)
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 20 11:51:05 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 117C	ARDL Lab No.:	006615-06
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318412
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1435	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	99%
4-Bromofluorobenzene	50-150	104%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318412.D
Acq On : 18 Mar 2014 2:29 pm
Operator :
Sample : 006615-06
Misc : 8260 SOIL MAK117C (1.99g)
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 20 11:50:32 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	275219	125.00 ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	284160	125.00 ug/Kg	0.00
System Monitoring Compounds					
2) Toluene-d8	7.83	98	496207	99.47 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 99.47%	
9) 4-Bromofluorobenzene	9.47	95	223873	103.52 ug/Kg	0.00
Spiked Amount 100.000			Recovery	= 103.52%	

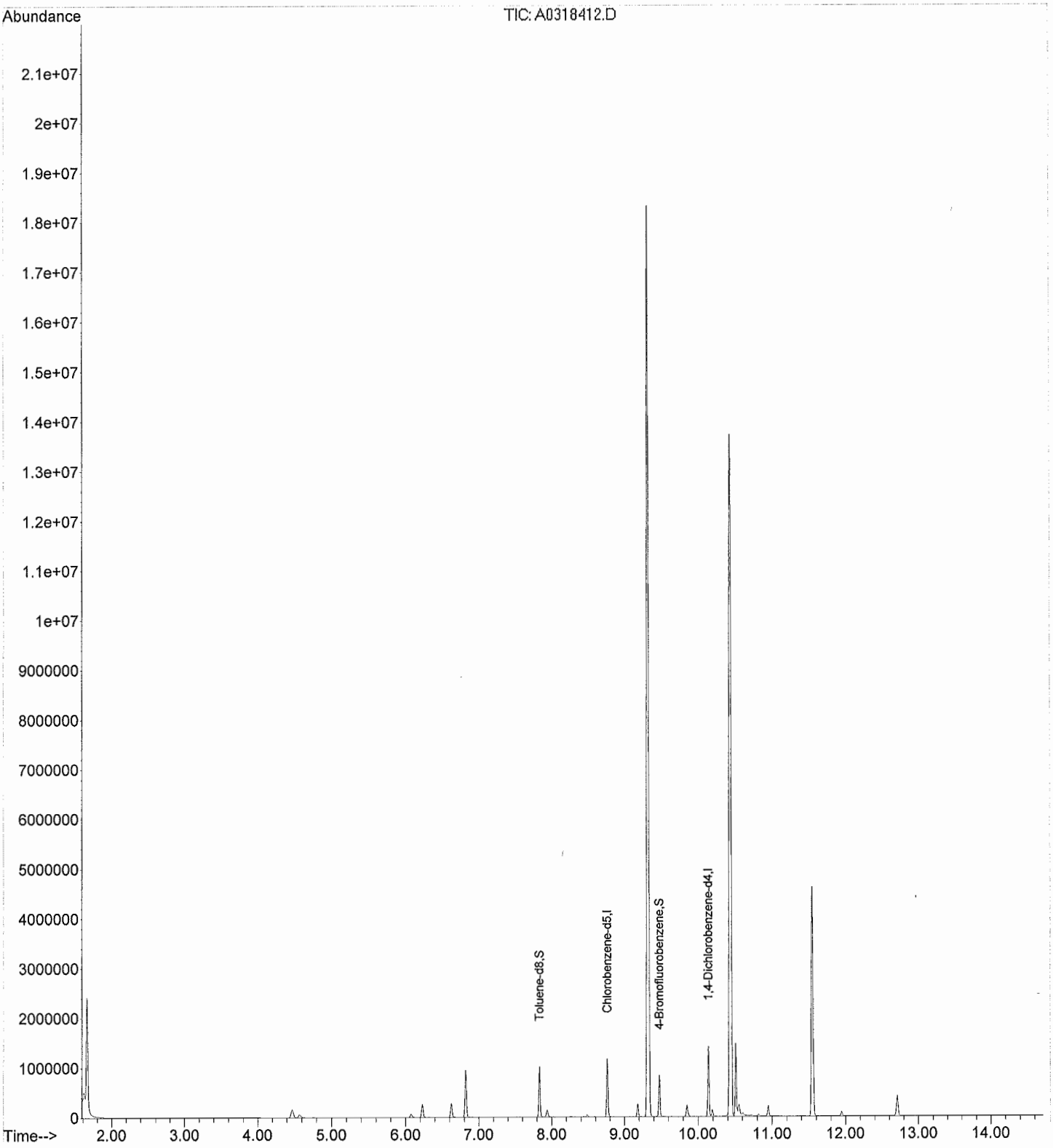
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318412.D
Acq On : 18 Mar 2014 2:29 pm
Operator :
Sample : 006615-06
Misc : 8260 SOIL MAK117C (1.99g)
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 20 11:50:32 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 118C	ARDL Lab No.:	006615-07
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318413
Sample Date:	01/31/2014	Received Date:	03/14/2014
Sample Time:	1605	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	94%
4-Bromofluorobenzene	50-150	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-07, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318413.D
Acq On : 18 Mar 2014 2:59 pm
Operator :
Sample : 006615-07
Misc : 8260 SOIL MAK118C (1.98g)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 20 11:50:38 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	267645	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	282113	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	454550	93.70	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 93.70%			
9) 4-Bromofluorobenzene	9.47	95	203877	94.96	ug/Kg	0.00
Spiked Amount 100.000			Recovery = 94.96%			

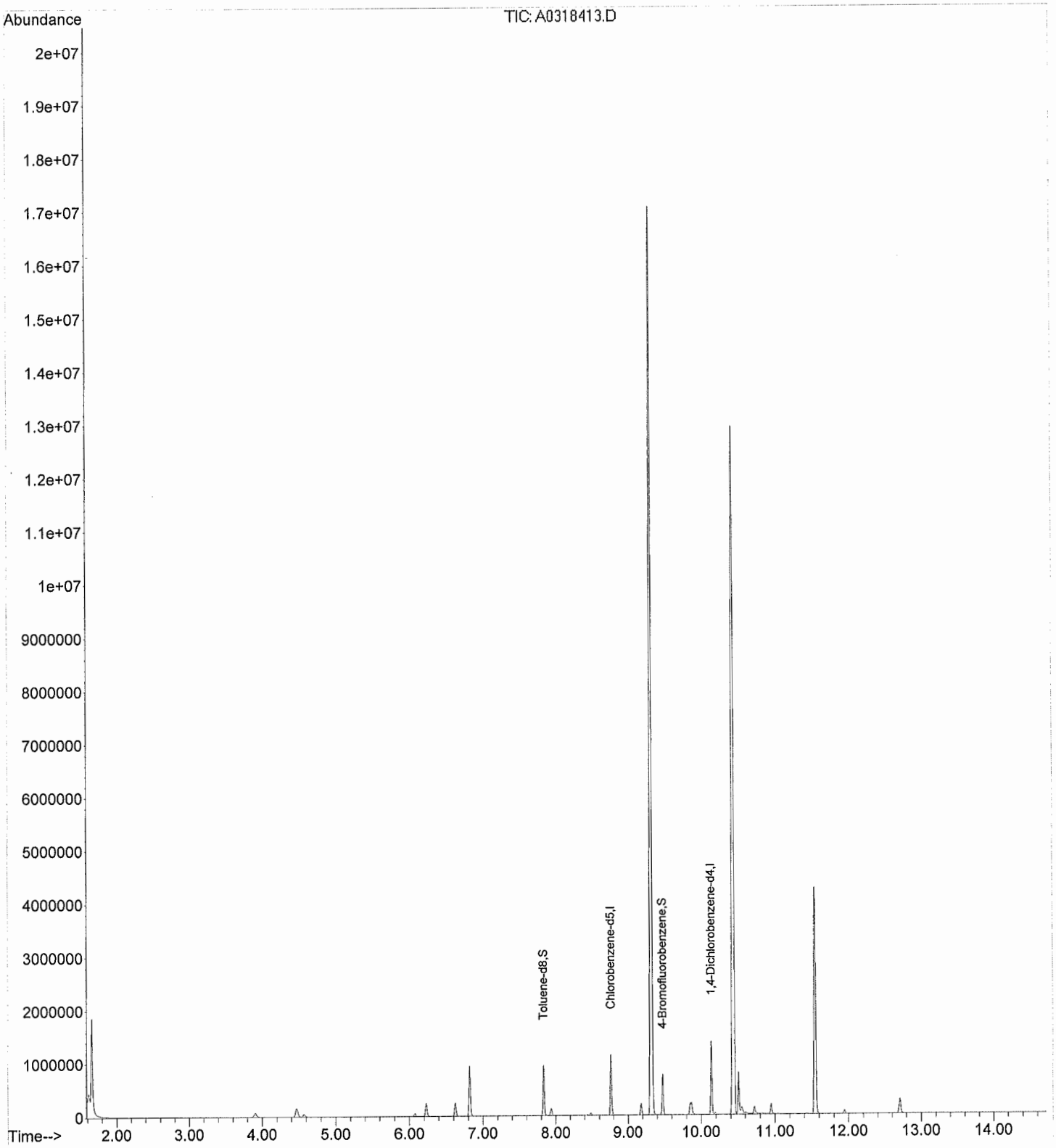
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318413.D
Acq On : 18 Mar 2014 2:59 pm
Operator :
Sample : 006615-07
Misc : 8260 SOIL MAK118C (1.98g)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 20 11:50:38 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



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Lab Report No: 006615 Report Date: 03/21/2014

Project Name: MAKAU MILITARY RESER Analysis: VOLATILES, GC/MS (8260)
Project No.: Analytical Method: 8260B
NELAC Certified - IL100308 Prep Method: 5030A

Field ID:	MAK 120C	ARDL Lab No.:	006615-08
Desc/Location:	MAKAU MILITARY RESERVATION	Lab Filename:	A0318414
Sample Date:	02/11/2014	Received Date:	03/14/2014
Sample Time:	1030	Prep. Date:	03/18/2014
Matrix:	TISSUE	Analysis Date:	03/18/2014
Amount Used:	2 g	Instrument ID:	AG1
Final Volume:	5 mL	QC Batch:	0321JFSM
% Moisture:	No Moisture Present	Level:	LOW

Parameter	Method Limit	Reporting Limit	Result	Data Flag	Units	Dilution Factor
Toluene	2.50	12.5	ND		UG/KG	1
Ethyl Benzene	2.50	12.5	ND		UG/KG	1
m & p-Xylene	5.0	25.0	ND		UG/KG	1
Styrene	2.50	12.5	ND		UG/KG	1
o-Xylene	2.50	12.5	ND		UG/KG	1
1,2,4-Trimethylbenzene	2.50	12.5	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
Toluene-d8	50-150	101%
4-Bromofluorobenzene	50-150	105%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

Sample 006615-08, VOLATILES, GC/MS (8260) Page 1 of 1

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318414.D
Acq On : 18 Mar 2014 3:28 pm
Operator :
Sample : 006615-08
Misc : 8260 SOIL MAK120C (2.01g)
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 20 11:50:45 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Chlorobenzene-d5	8.76	82	259839	125.00	ug/Kg	0.00
8) 1,4-Dichlorobenzene-d4	10.14	152	269310	125.00	ug/Kg	0.00
System Monitoring Compounds						
2) Toluene-d8	7.83	98	476996	101.28	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	101.28%	
9) 4-Bromofluorobenzene	9.47	95	215966	105.37	ug/Kg	0.00
Spiked Amount 100.000			Recovery	=	105.37%	

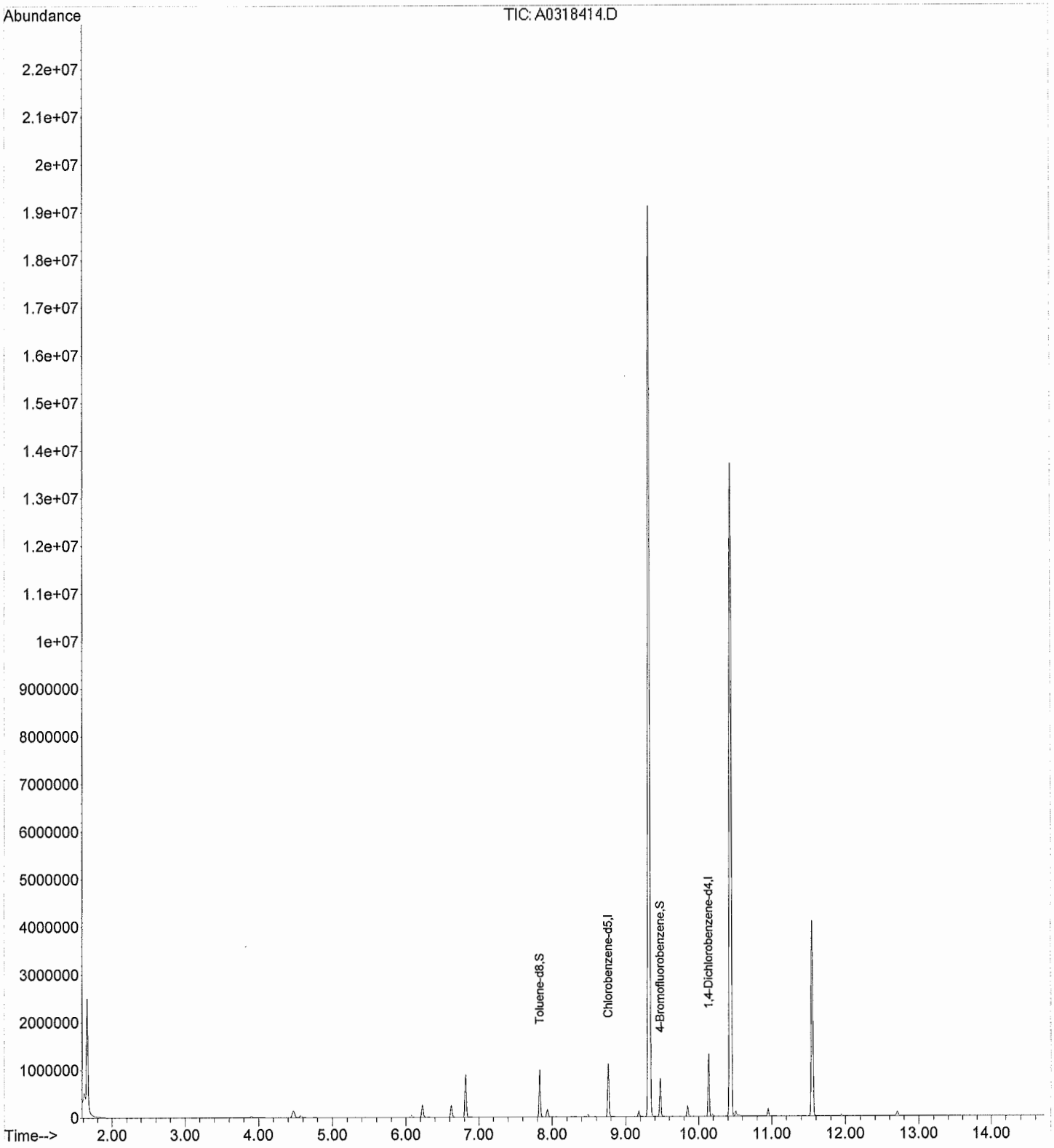
Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\031814\
Data File : A0318414.D
Acq On : 18 Mar 2014 3:28 pm
Operator :
Sample : 006615-08
Misc : 8260 SOIL MAK120C (2.01g)
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 20 11:50:45 2014
Quant Method : C:\MSDCHEM\1\METHODS\SOIL_44HI.M
Quant Title : 8260 VOLATILES
QLast Update : Thu Mar 20 11:43:22 2014
Response via : Initial Calibration



Example Calculation

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EXAMPLE CALCULATIONS

Response Factor Calculations

The data system tabulates the area response of the characteristic ions against the concentration for each compound and each internal standard. Response factors (RF) are calculated for each compound relative to the internal standard assignments. The RF is calculated as follows:

$$RF = (A_X C_{is})/A_{is} C_X)$$

where:

A_X = Area of the characteristic ion for the compound being measured.
A_{is} = Area of the characteristic ion for the specific internal standard.
C_{is} = Concentration of the specific internal standard.
C_X = Concentration of the compound being measured.

The RF is calculated for each standard concentration level in the initial calibration curve. The average RF is then calculated off these points.

Sample Calculations

Sample calculations are made by the instrument software and are performed as follows:

Water

$$\text{Concentration (ug/L)} = \frac{(Ax)\,(Is)}{(Ais)\,(RF)(V_o)}$$

where:

A_X = Area of characteristic ion for compound being measured.
Is = Amount of internal standard injected (ng).
A_{is} = Area of characteristic ion for the internal standard.
RF = Average response factor for compound being measured.
V_o = Volume of water purged (mL).

Soil: (low level)

$$\text{concentration (ug/Kg)} = \frac{(A_X)(Is)}{(A_{is})(RF)(W_g)}$$

where:

A_X = Area of characteristic ion for compound being measured.
Is = Amount of internal standard injected (ng).
A_{is} = Area of characteristic ion for the internal standard.
RF = Average response factor for compound being measured.
W_g = Weight of sample purged (g).

EXAMPLE CALCULATIONS

Sample Calculations

Sediment/Soil, Sludge, and Waste: (medium level)

$$\text{Concentration (ug/kg)} = \frac{(A_x)(Is)(V_t)}{(A_{is})(RF)(V_i)(W_g)}$$

where:

A_x, Is, A_{is}, RF = same as for soil above.

V_t = Volume of total extract (uL) (use 10,000 uL or a factor of this when dilutions are made).

V_i = Volume of extract added (uL) for purging.

W_g = Weight of sample extracted (g).

Instrument software is not set up to account for the medium level extraction procedure. Concentrations appearing on the quantitation report must be multiplied by a factor of 125 to correct for sample weight and extract volumes.

Sample Calculations

Sample No.: 006615-05MS Compound: Toluene

Matrix: Tissue

$$\text{Concentration (ug/kg)} = \frac{(619323)(250ng)(__)}{(260269)(3.039)(2g)(__)} = 98.2$$

Example Calculations Performed By: LS Date: 4/08/14

Miscellaneous Additional Data

(If applicable)

☒ **None** LS 4/08/14

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