



09/27/12

## Technical Report for

**XTO Energy**

**T78X-12G**

**1007-06**

**Accutest Job Number: D38940**

**Sampling Date: 09/18/12**

### Report to:

KRW Consulting, Inc.  
8000 West 14th Avenue  
Lakewood, CO 80214  
dknudson@krwconsulting.com; jhess@krwconsulting.com;  
crachak@krwconsulting.com; rrasnic@krwconsulting.com;  
ATTN: Dwayne Knudson

**Total number of pages in report: 151**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
**Brad Madadian**  
Laboratory Director

**Client Service contact: Renea Jackson 303-425-6021**

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.  
Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>4</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>5</b>
<b>Section 3: Summary of Hits .....</b>	<b>8</b>
<b>Section 4: Sample Results .....</b>	<b>9</b>
<b>4.1: D38940-1: RP CONTENTS POST SOLIDIFICATION .....</b>	<b>10</b>
<b>4.2: D38940-1A: RP CONTENTS POST SOLIDIFICATION .....</b>	<b>16</b>
<b>Section 5: Misc. Forms .....</b>	<b>18</b>
<b>5.1: Chain of Custody .....</b>	<b>19</b>
<b>Section 6: GC/MS Volatiles - QC Data Summaries .....</b>	<b>21</b>
<b>6.1: Method Blank Summary .....</b>	<b>22</b>
<b>6.2: Blank Spike Summary .....</b>	<b>23</b>
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>24</b>
<b>Section 7: GC/MS Volatiles - Raw Data .....</b>	<b>25</b>
<b>7.1: Samples .....</b>	<b>26</b>
<b>7.2: Method Blanks .....</b>	<b>30</b>
<b>Section 8: GC/MS Semi-volatiles - QC Data Summaries .....</b>	<b>35</b>
<b>8.1: Method Blank Summary .....</b>	<b>36</b>
<b>8.2: Blank Spike Summary .....</b>	<b>37</b>
<b>8.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>38</b>
<b>Section 9: GC/MS Semi-volatiles - Raw Data .....</b>	<b>39</b>
<b>9.1: Samples .....</b>	<b>40</b>
<b>9.2: Method Blanks .....</b>	<b>74</b>
<b>Section 10: GC Volatiles - QC Data Summaries .....</b>	<b>91</b>
<b>10.1: Method Blank Summary .....</b>	<b>92</b>
<b>10.2: Blank Spike Summary .....</b>	<b>93</b>
<b>10.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>94</b>
<b>Section 11: GC Volatiles - Raw Data .....</b>	<b>95</b>
<b>11.1: Samples .....</b>	<b>96</b>
<b>11.2: Method Blanks .....</b>	<b>101</b>
<b>Section 12: GC Semi-volatiles - QC Data Summaries .....</b>	<b>106</b>
<b>12.1: Method Blank Summary .....</b>	<b>107</b>
<b>12.2: Blank Spike Summary .....</b>	<b>108</b>
<b>12.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>109</b>
<b>Section 13: GC Semi-volatiles - Raw Data .....</b>	<b>110</b>
<b>13.1: Samples .....</b>	<b>111</b>
<b>13.2: Method Blanks .....</b>	<b>114</b>
<b>Section 14: Metals Analysis - QC Data Summaries .....</b>	<b>117</b>
<b>14.1: Prep QC MP8469: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn .....</b>	<b>118</b>
<b>14.2: Prep QC MP8470: As .....</b>	<b>128</b>
<b>14.3: Prep QC MP8479: Hg .....</b>	<b>133</b>
<b>14.4: Prep QC MP8480: Ca,Mg,Na,Sodium Adsorption Ratio .....</b>	<b>137</b>
<b>Section 15: General Chemistry - QC Data Summaries .....</b>	<b>147</b>

# Table of Contents

Sections:

-2-

15.1:	Method Blank and Spike Results Summary .....	148
15.2:	Duplicate Results Summary .....	149
15.3:	Matrix Spike Results Summary .....	150
15.4:	Matrix Spike Duplicate Results Summary .....	151

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15



Sample Summary

XTO Energy

Job No: D38940

T78X-12G

Project No: 1007-06

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D38940-1	09/18/12	14:15 DS	09/20/12	SO	Soil	RP CONTENTS POST SOLIDIFICATION
D38940-1A	09/18/12	14:15 DS	09/20/12	SO	Soil	RP CONTENTS POST SOLIDIFICATION

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy

**Job No** D38940

**Site:** T78X-12G

**Report Date** 9/27/2012 8:15:47 AM

On 09/20/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.0 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D38940 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

<b>Matrix</b> SO	<b>Batch ID:</b> V3V1202
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38937-1MS, D38937-1MSD were used as the QC samples indicated.

### Extractables by GCMS By Method SW846 8270C BY SIM

<b>Matrix</b> SO	<b>Batch ID:</b> OP6679
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D38939-1MS, D38939-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The RPD(s) for the MS and MSD recoveries of Naphthalene are outside control limits for sample OP6679-MSD. Variability of recovery may be due to sample matrix/homogeneity.
- Sample(s) D38940-1 have surrogates outside control limits. Probable cause due to matrix interference.
- D38940-1 for Nitrobenzene-d5: Outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

<b>Matrix</b> SO	<b>Batch ID:</b> OP6688
------------------	-------------------------

- The data for SW846 8270C BY SIM meets quality control requirements.
- Sample(s) D38940-1 have surrogates outside control limits. Probable cause due to matrix interference.
- D38940-1: Confirmation run.

### Volatiles by GC By Method SW846 8015B

<b>Matrix</b> SO	<b>Batch ID:</b> GGB968
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D38937-1MS, D38937-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Extractables by GC By Method SW846-8015B

<b>Matrix</b> SO	<b>Batch ID:</b> OP6680
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38937-1MS, D38937-1MSD were used as the QC samples indicated.

## Metals By Method SW846 6010C

**Matrix** AQ

**Batch ID:** MP8480

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38940-1AMS, D38940-1AMSD, D38940-1ASDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Calcium, Sodium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

**Matrix** SO

**Batch ID:** MP8469

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38897-1MS, D38897-1MSD, D38897-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Cadmium, Silver, Chromium, Nickel, Zinc are outside control limits for sample MP8469-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP8469-SD1 for Chromium: Serial dilution indicates possible matrix interference.
- MP8469-SD1 for Nickel: Serial dilution indicates possible matrix interference.
- MP8469-SD1 for Zinc: Serial dilution indicates possible matrix interference.

## Metals By Method SW846 6020A

**Matrix** SO

**Batch ID:** MP8470

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38897-1MS, D38897-1MSD, D38897-1SDL were used as the QC samples for the metals analysis.

## Metals By Method SW846 7471B

**Matrix** SO

**Batch ID:** MP8479

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38939-1MS, D38939-1MSD were used as the QC samples for the metals analysis.

## Wet Chemistry By Method ASTM D1498-76M

**Matrix** SO

**Batch ID:** GN16882

- Sample(s) D38940-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

## Wet Chemistry By Method SM19 2540B M

**Matrix** SO

**Batch ID:** GN16857

- The data for SM19 2540B M meets quality control requirements.

## Wet Chemistry By Method SW846 3060/7196A M

**Matrix** SO

**Batch ID:** R14553

- The data for SW846 3060/7196A M meets quality control requirements.
- D38940-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

## Wet Chemistry By Method SW846 3060A/7196A

**Matrix** SO

**Batch ID:** GP8246

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D38939-1MS, D38939-1MSD, D38939-1DUP were used as the QC samples for the Chromium, Hexavalent analysis.
- The duplicate RPD(s) for Chromium, Hexavalent are outside control limits for sample GP8246-D1. RPD acceptable due to low duplicate and sample concentrations.
- D38940-1 for Chromium, Hexavalent: Elevated detection limit due to matrix interference.

## Wet Chemistry By Method SW846 9045D

**Matrix** SO

**Batch ID:** GN16879

- The following samples were run outside of holding time for method SW846 9045D: D38940-1

## Wet Chemistry By Method USDA HANDBOOK 60

**Matrix** SO

**Batch ID:** MP8480

- D38940-1A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

## Summary of Hits

Page 1 of 1

**Job Number:** D38940  
**Account:** XTO Energy  
**Project:** T78X-12G  
**Collected:** 09/18/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

### D38940-1 RP CONTENTS POST SOLIDIFICATION

Naphthalene	0.0354	0.019	0.016	mg/kg	SW846 8270C BY SIM
TPH-DRO (C10-C28)	301	21	14	mg/kg	SW846-8015B
Arsenic	10.2	0.32		mg/kg	SW846 6020A
Barium	4220	1.6		mg/kg	SW846 6010C
Chromium	15.2	1.6		mg/kg	SW846 6010C
Copper	18.2	1.6		mg/kg	SW846 6010C
Lead	19.8	7.9		mg/kg	SW846 6010C
Nickel	130	4.7		mg/kg	SW846 6010C
Zinc	54.3	4.7		mg/kg	SW846 6010C
Specific Conductivity	12100	1.0		umhos/cm	SM2510B-1997 MOD
Redox Potential Vs H2	13.5			mv	ASTM D1498-76M
pH	12.53			su	SW846 9045D

### D38940-1A RP CONTENTS POST SOLIDIFICATION

Calcium	1050	2.0		mg/l	SW846 6010C
Sodium	818	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>a</sup>	6.94			ratio	USDA HANDBOOK 60

(a) Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$



Sample Results

Report of Analysis

Accutest Laboratories

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION			<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1			<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	62.8
<b>Method:</b>	SW846 8260B				
<b>Project:</b>	T78X-12G				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V20615.D	1	09/21/12	BD	n/a	n/a	V3V1202
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.09 g	5.0 ml	100 ul
Run #2			

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.11	0.054	mg/kg	
108-88-3	Toluene	ND	0.22	0.11	mg/kg	
100-41-4	Ethylbenzene	ND	0.22	0.041	mg/kg	
1330-20-7	Xylene (total)	ND	0.43	0.22	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	86%		64-130%
460-00-4	4-Bromofluorobenzene	105%		62-131%
17060-07-0	1,2-Dichloroethane-D4	91%		70-130%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION			<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1			<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	62.8
<b>Method:</b>	SW846 8270C BY SIM SW846 3546				
<b>Project:</b>	T78X-12G				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G11342.D	1	09/21/12	DC	09/21/12	OP6679	E3G529
Run #2 <sup>a</sup>	3G11380.D	1	09/24/12	DC	09/24/12	OP6688	E3G531

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2	30.0 g	1.0 ml

## COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.013	0.0069	mg/kg	
120-12-7	Anthracene	ND	0.013	0.0069	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.013	0.0069	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.013	0.0069	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.013	0.0069	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.013	0.0069	mg/kg	
218-01-9	Chrysene	ND	0.013	0.0069	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.013	0.0069	mg/kg	
206-44-0	Fluoranthene	ND	0.013	0.0069	mg/kg	
86-73-7	Fluorene	ND	0.013	0.0069	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.013	0.0069	mg/kg	
91-20-3	Naphthalene	0.0354	0.019	0.016	mg/kg	
129-00-0	Pyrene	ND	0.013	0.0069	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	3% <sup>b</sup>	8%	10-145%
321-60-8	2-Fluorobiphenyl	44%	30%	10-130%
1718-51-0	Terphenyl-d14	75%	35%	22-130%

(a) Confirmation run.

(b) Outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION					<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1					<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil					<b>Percent Solids:</b>	62.8
<b>Method:</b>	SW846 8015B						
<b>Project:</b>	T78X-12G						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17643.D	1	09/20/12	SK	n/a	n/a	GGB968
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	22	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	87%		60-140%		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION					<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1					<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil					<b>Percent Solids:</b>	62.8
<b>Method:</b>	SW846-8015B SW846 3546						
<b>Project:</b>	T78X-12G						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD17679.D	1	09/21/12	AV	09/21/12	OP6680	GFD904
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	301	21	14	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	71%		43-136%		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION	<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1	<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	62.8
<b>Project:</b>	T78X-12G		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	10.2	0.32	mg/kg	10	09/24/12	09/26/12 JB	SW846 6020A <sup>3</sup>	SW846 3050B <sup>5</sup>
Barium	4220	1.6	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Cadmium	< 1.6	1.6	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Chromium	15.2	1.6	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Copper	18.2	1.6	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Lead	19.8	7.9	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Mercury	< 0.16	0.16	mg/kg	1	09/25/12	09/25/12 JM	SW846 7471B <sup>1</sup>	SW846 7471B <sup>6</sup>
Nickel	130	4.7	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Selenium	< 7.9	7.9	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Silver	< 4.7	4.7	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>
Zinc	54.3	4.7	mg/kg	1	09/24/12	09/25/12 JM	SW846 6010C <sup>2</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA2839

(2) Instrument QC Batch: MA2842

(3) Instrument QC Batch: MA2845

(4) Prep QC Batch: MP8469

(5) Prep QC Batch: MP8470

(6) Prep QC Batch: MP8479

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION	<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1	<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	62.8
<b>Project:</b>	T78X-12G		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>prep: DEPT.OF AG, BOOK N9</b>							
Specific Conductivity	12100	1.0	umhos/cm	1	09/26/12	CJ	SM2510B-1997 MOD
Chromium, Hexavalent <sup>a</sup>	< 20	20	mg/kg	20	09/25/12	CJ	SW846 3060A/7196A
Chromium, Trivalent <sup>b</sup>	< 22	22	mg/kg	1	09/25/12 22:13	JM	SW846 3060/7196A M
Redox Potential Vs H2	13.5		mv	1	09/21/12	JD	ASTM D1498-76M
Solids, Percent	62.8		%	1	09/21/12	SWT	SM19 2540B M
pH	12.53		su	1	09/21/12 14:25	JD	SW846 9045D

(a) Elevated detection limit due to matrix interference.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION	<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1A	<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	62.8
<b>Project:</b>	T78X-12G		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	1050	2.0	mg/l	1	09/24/12	09/25/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	< 1.0	1.0	mg/l	1	09/24/12	09/25/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	818	2.0	mg/l	1	09/24/12	09/25/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

(1) Instrument QC Batch: MA2842  
(2) Prep QC Batch: MP8480

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	RP CONTENTS POST SOLIDIFICATION	<b>Date Sampled:</b>	09/18/12
<b>Lab Sample ID:</b>	D38940-1A	<b>Date Received:</b>	09/20/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	62.8
<b>Project:</b>	T78X-12G		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	6.94		ratio	1	09/25/12 19:47	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody



## CHAIN OF CUSTODY

PAGE 1 OF 1

4036 Youngfield Street, Wheat Ridge, CO 80033  
TEL: 303-425-6021 FAX: 303-425-6854  
www.accutest.com

FEQ-EX Tracking #	Bottle Order Control #
Accutest Quote #	Accutest Job # <b>D38940</b>
Client / Reporting Information	
Project Name: <b>XTO PCW 778X-1267</b>	
Company Name: <b>KRW Consulting</b>	
Street Address: <b>8000 West 14th Street, Suite 200</b>	
City: <b>Lakewood, CO 80214</b>	
Project Contact: <b>Dwayne Knudson</b>	
Phone #: <b>970-488-1098</b>	
Sample(s) Name(s): <b>DAVID SANDERS 970-488-1098</b>	
Project Manager: <b>Joe Hess</b>	
Billing Information (if different from Report to)	
Company Name: <b>XTO Energy</b>	
Street Address: <b>21489 CR 5</b>	
City: <b>Rifle, CO 81650</b>	
Attendant: <b>Jessica Dooling</b>	
Requested Analysis (see TEST CODE sheet)	
Matrix Codes	
LAB USE ONLY	
DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
Turnaround Time (Business days)	
Data Deliverable Information	
Comments / Special Instructions	
Approved By (Accutest PM): / Date:	
Commercial "A" (Level 1) Commercial "B" (Level 2) COMMBN COMMBN+ Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial BN = Results/QC/Nettels (+ = chromatograms)	
State Forms Required Send Forms to State Report by Fax Report by PDF ONLY EDD Format	
Please email to: <b>KRW Piceance Team</b>	
Emergency & Rush T/A data available VIA Lablink	
Sample Custody must be documented below each time samples change possession, including courier delivery.	
Relinquished by Sampler: <b>1 Lori Albino</b>	
Date Time: <b>9-19-12 14:30</b>	
Received By: <b>1 Rite Service Center</b>	
Date Time: <b>9-19-12 14:30</b>	
Relinquished by Sampler: <b>3</b>	
Date Time: <b>9-19-12 14:30</b>	
Received By: <b>3</b>	
Date Time: <b>9-19-12 14:30</b>	
Relinquished by Sampler: <b>5</b>	
Date Time: <b>9-19-12 14:30</b>	
Received By: <b>5</b>	
Date Time: <b>9-19-12 14:30</b>	
Custody Seal # <b>HD10</b>	
Intact <input checked="" type="checkbox"/> Not Intact <input type="checkbox"/>	
Preserved where applicable <input type="checkbox"/>	
On Ice <input checked="" type="checkbox"/> Cooler Temp. <b>2.0</b>	

D38940: Chain of Custody

Page 1 of 2

## Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** D38940

**Client:** KRW CONSULTING

**Immediate Client Services Action Required:** No

**Date / Time Received:** 9/20/2012 12:15:00 PM

**No. Coolers:** 1

**Client Service Action Required at Login:** No

**Project:** XTO PCU T78X-12G

**Airbill #'s:** HDCO

<b>Cooler Security</b>	<b>Y</b>	<b>or</b>	<b>N</b>		<b>Y</b>	<b>or</b>	<b>N</b>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Cooler Temperature</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

 Accutest Laboratories  
 V:(303) 425-6021

 4036 Youngfield Street  
 F: (303) 425-6854

 Wheat Ridge, CO  
 www.accutest.com

## GC/MS Volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1202-MB	3V20608.D	1	09/20/12	BD	n/a	n/a	V3V1202

The QC reported here applies to the following samples:

Method: SW846 8260B

D38940-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	25	ug/kg	
100-41-4	Ethylbenzene	ND	100	19	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	200	100	ug/kg	

CAS No.	Surrogate Recoveries	Limits
2037-26-5	Toluene-D8	92% 64-130%
460-00-4	4-Bromofluorobenzene	100% 62-131%
17060-07-0	1,2-Dichloroethane-D4	91% 70-130%

## Blank Spike Summary

Page 1 of 1

**Job Number:** D38940

**Account:** XTOKRWR XTO Energy

**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1202-BS	3V20609.D	1	09/20/12	BD	n/a	n/a	V3V1202

The QC reported here applies to the following samples:

Method: SW846 8260B

D38940-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	44.7	89	70-130
100-41-4	Ethylbenzene	50	46.6	93	70-130
108-88-3	Toluene	50	44.4	89	70-130
1330-20-7	Xylene (total)	150	147	98	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	92%	64-130%
460-00-4	4-Bromofluorobenzene	104%	62-131%
17060-07-0	1,2-Dichloroethane-D4	91%	70-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D38937-1MS	3V20611.D	1	09/21/12	BD	n/a	n/a	V3V1202
D38937-1MSD	3V20612.D	1	09/21/12	BD	n/a	n/a	V3V1202
D38937-1	3V20610.D	1	09/21/12	BD	n/a	n/a	V3V1202

The QC reported here applies to the following samples:

Method: SW846 8260B

D38940-1

CAS No.	Compound	D38937-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		3130	2890	92	2890	92	0	64-139/30
100-41-4	Ethylbenzene	ND		3130	3020	96	3030	97	0	68-136/30
108-88-3	Toluene	85.7	J	3130	2750	85	2790	86	1	60-130/30
1330-20-7	Xylene (total)	156	J	9390	9520	100	9530	100	0	58-142/30

CAS No.	Surrogate Recoveries	MS	MSD	D38937-1	Limits
2037-26-5	Toluene-D8	85%	86%	87%	64-130%
460-00-4	4-Bromofluorobenzene	112%	111%	107%	62-131%
17060-07-0	1,2-Dichloroethane-D4	86%	87%	89%	70-130%

\* = Outside of Control Limits.



GC/MS Volatiles

Raw Data

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V3092012.S\  
Data File : 3V20615.D  
Acq On : 21 Sep 2012 3:07 am  
Operator : BRETD  
Sample : D38940-1  
Misc : MS4691,V3V1202,5.086,,100,5,1  
ALS Vial : 35 Sample Multiplier: 1

Quant Time: Sep 21 10:16:16 2012  
Quant Method : C:\msdchem\1\METHODS\V3AP1160TVH1160SOIL.M  
Quant Title : 8260  
QLast Update : Fri Aug 24 10:57:50 2012  
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.861	168	252862	50.00	ug/l	0.00
35) 1,4-Difluorobenzene	12.657	114	384562	50.00	ug/l	0.00
53) Chlorobenzene-d5	15.295	117	393380	50.00	ug/l	0.00
74) 1,4-Dichlorobenzene-d4	17.287	152	232896	50.00	ug/l	0.00

System Monitoring Compounds						
33) 1,2-Dichloroethane-d4	12.256	102	25853	45.41	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	90.82%
61) Toluene-d8	14.053	98	443596	43.19	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	86.38%
69) 4-Bromofluorobenzene	16.244	95	211717	52.68	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	105.36%

Target Compounds					Qvalue
1) TVH-Gasoline	13.329	TIC	36762m	1.29	ug/l
62) Toluene	14.107	92	5541	0.56	ug/l
72) m,p-xylene	15.449	106	2810	0.38	ug/l
91) Naphthalene	19.842	128	4677	0.39	ug/l

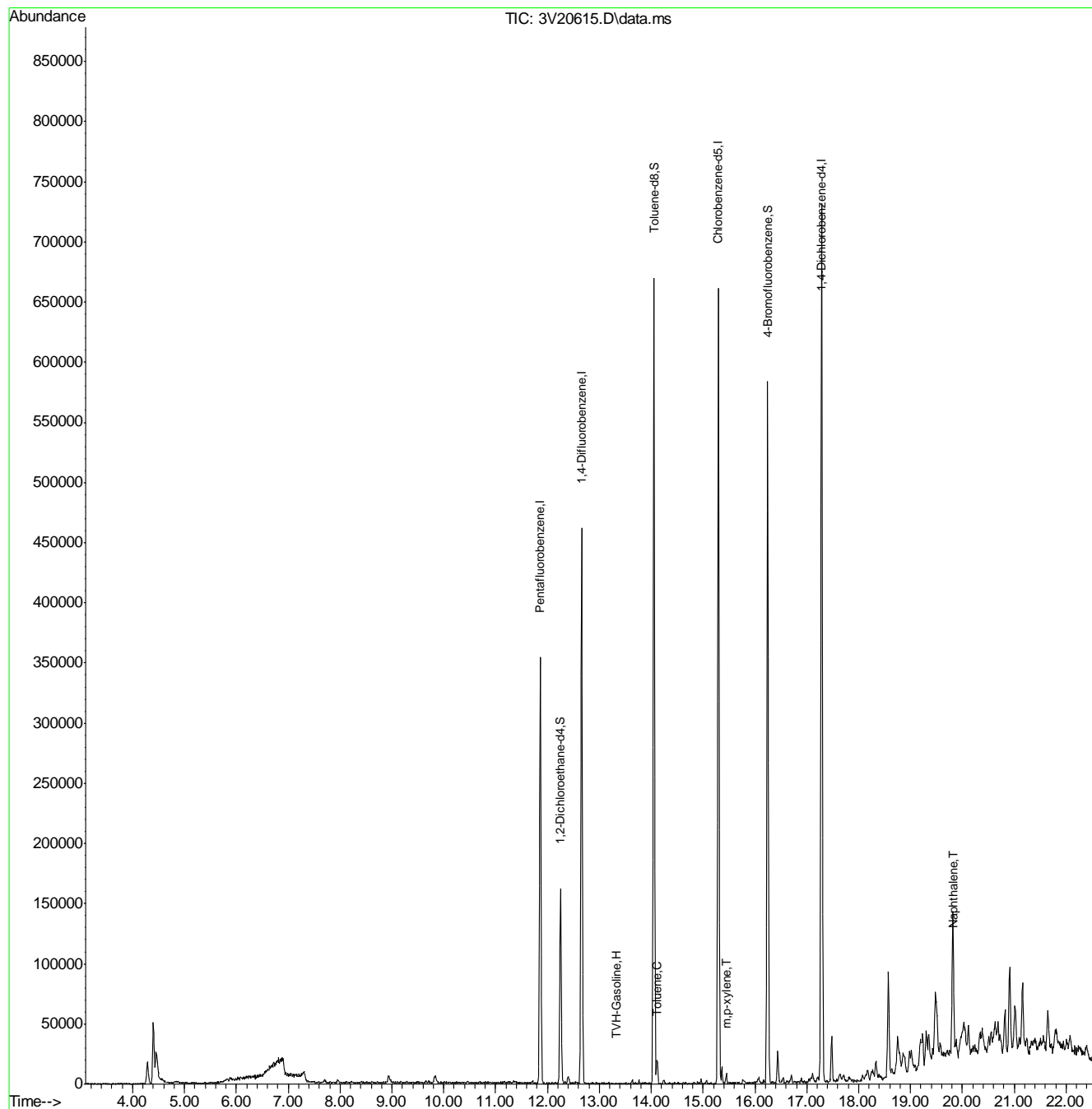
(#) = qualifier out of range (m) = manual integration (+) = signals summed

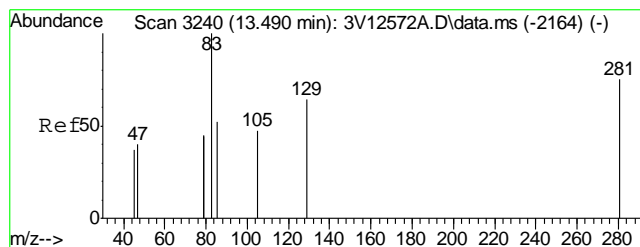
7.1.1  
7

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V3092012.S\  
Data File : 3V20615.D  
Acq On : 21 Sep 2012 3:07 am  
Operator : BRETD  
Sample : D38940-1  
Misc : MS4691,V3V1202,5.086,,100,5,1  
ALS Vial : 35 Sample Multiplier: 1

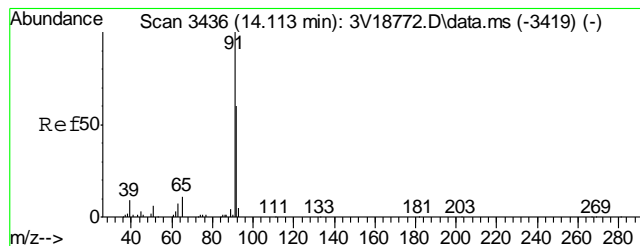
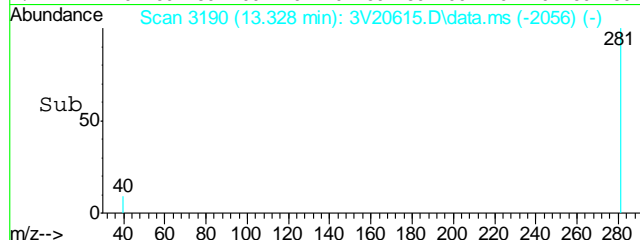
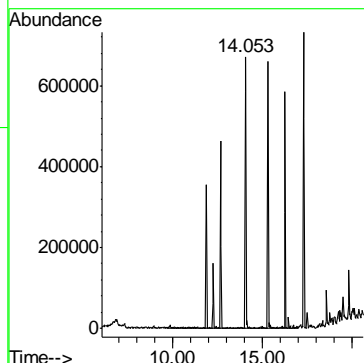
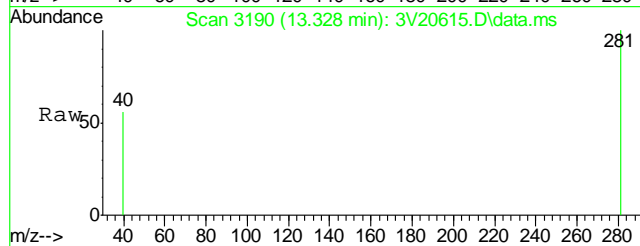
Quant Time: Sep 21 10:16:16 2012  
Quant Method : C:\msdchem\1\METHODS\V3AP1160TVH1160SOIL.M  
Quant Title : 8260  
QLast Update : Fri Aug 24 10:57:50 2012  
Response via : Initial Calibration





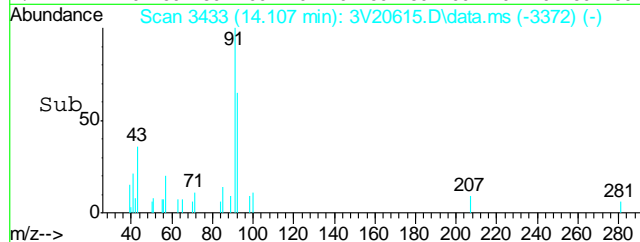
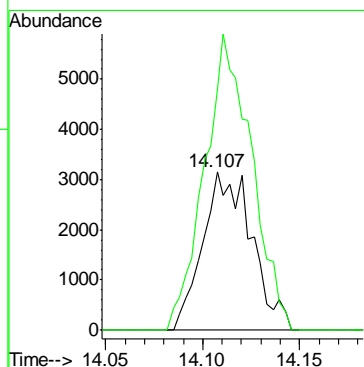
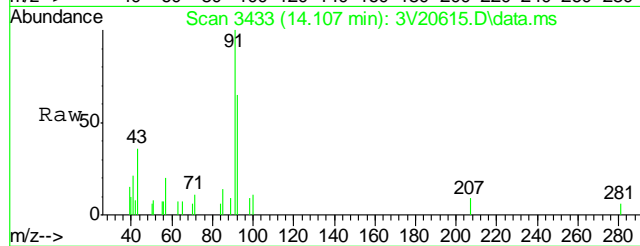
#1  
TVH-Gasoline  
Concen: 1.29 ug/l m  
RT: 13.329 min Scan# 3190  
Delta R.T. 0.000 min  
Lab File: 3V20615.D  
Acq: 21 Sep 2012 3:07 am

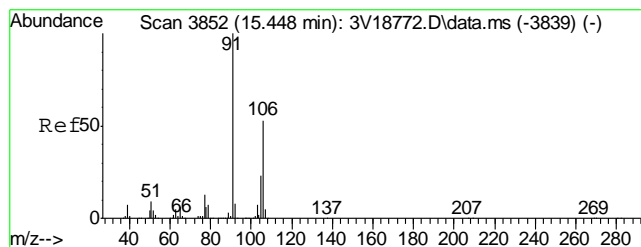
Tgt Ion:TIC Resp: 36762



#62  
Toluene  
Concen: 0.56 ug/l  
RT: 14.107 min Scan# 3433  
Delta R.T. -0.005 min  
Lab File: 3V20615.D  
Acq: 21 Sep 2012 3:07 am

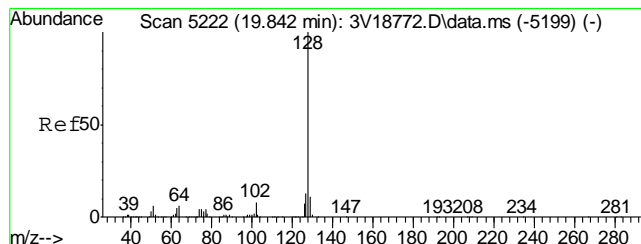
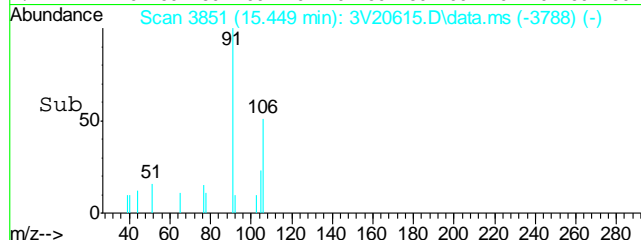
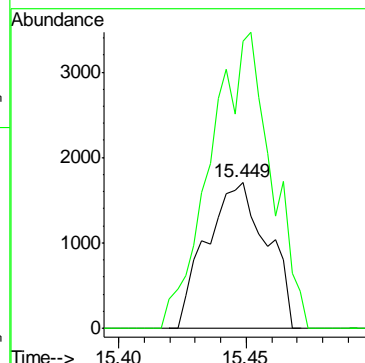
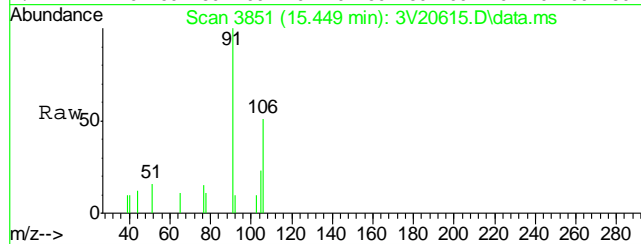
Tgt Ion: 92 Resp: 5541  
Ion Ratio Lower Upper  
92 100  
91 180.3 150.2 190.2





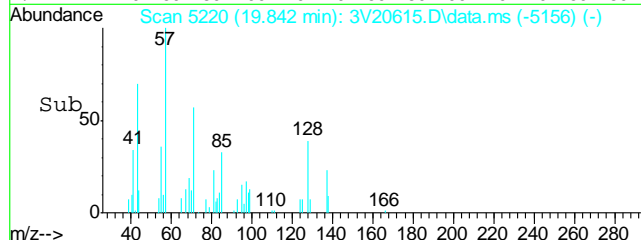
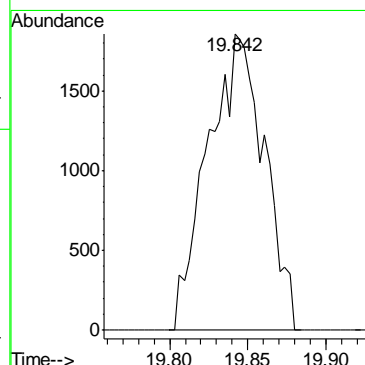
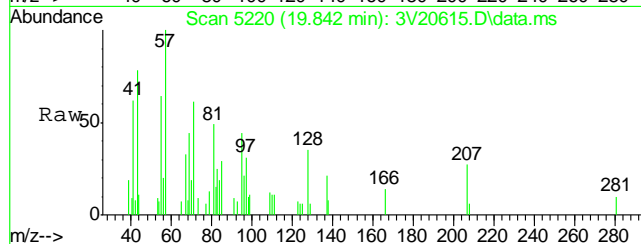
#72  
m,p-xylene  
Concen: 0.38 ug/l  
RT: 15.449 min Scan# 3851  
Delta R.T. 0.001 min  
Lab File: 3V20615.D  
Acq: 21 Sep 2012 3:07 am

Tgt Ion:106 Resp: 2810  
Ion Ratio Lower Upper  
106 100  
91 204.5 168.1 208.1



#91  
Naphthalene  
Concen: 0.39 ug/l  
RT: 19.842 min Scan# 5220  
Delta R.T. 0.004 min  
Lab File: 3V20615.D  
Acq: 21 Sep 2012 3:07 am

Tgt Ion:128 Resp: 4677



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V3092012.S\  
 Data File : 3V20608.D  
 Acq On : 20 Sep 2012 11:27 pm  
 Operator : BRETD  
 Sample : MB  
 Misc : MS4691,V3V1202,5.00,,100,5,1  
 ALS Vial : 28 Sample Multiplier: 1

Quant Time: Sep 21 09:45:41 2012  
 Quant Method : C:\msdchem\1\METHODS\V3AP1160TVH1160SOIL.M  
 Quant Title : 8260  
 QLast Update : Fri Aug 24 10:57:50 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.866	168	250434	50.00	ug/l	0.00
35) 1,4-Difluorobenzene	12.659	114	381856	50.00	ug/l	0.00
53) Chlorobenzene-d5	15.296	117	363216	50.00	ug/l	0.00
74) 1,4-Dichlorobenzene-d4	17.286	152	203473	50.00	ug/l	0.00

System Monitoring Compounds						
33) 1,2-Dichloroethane-d4	12.254	102	25748	45.66	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	91.32%
61) Toluene-d8	14.054	98	434148	45.79	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	91.58%
69) 4-Bromofluorobenzene	16.246	95	185202	49.91	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	99.82%

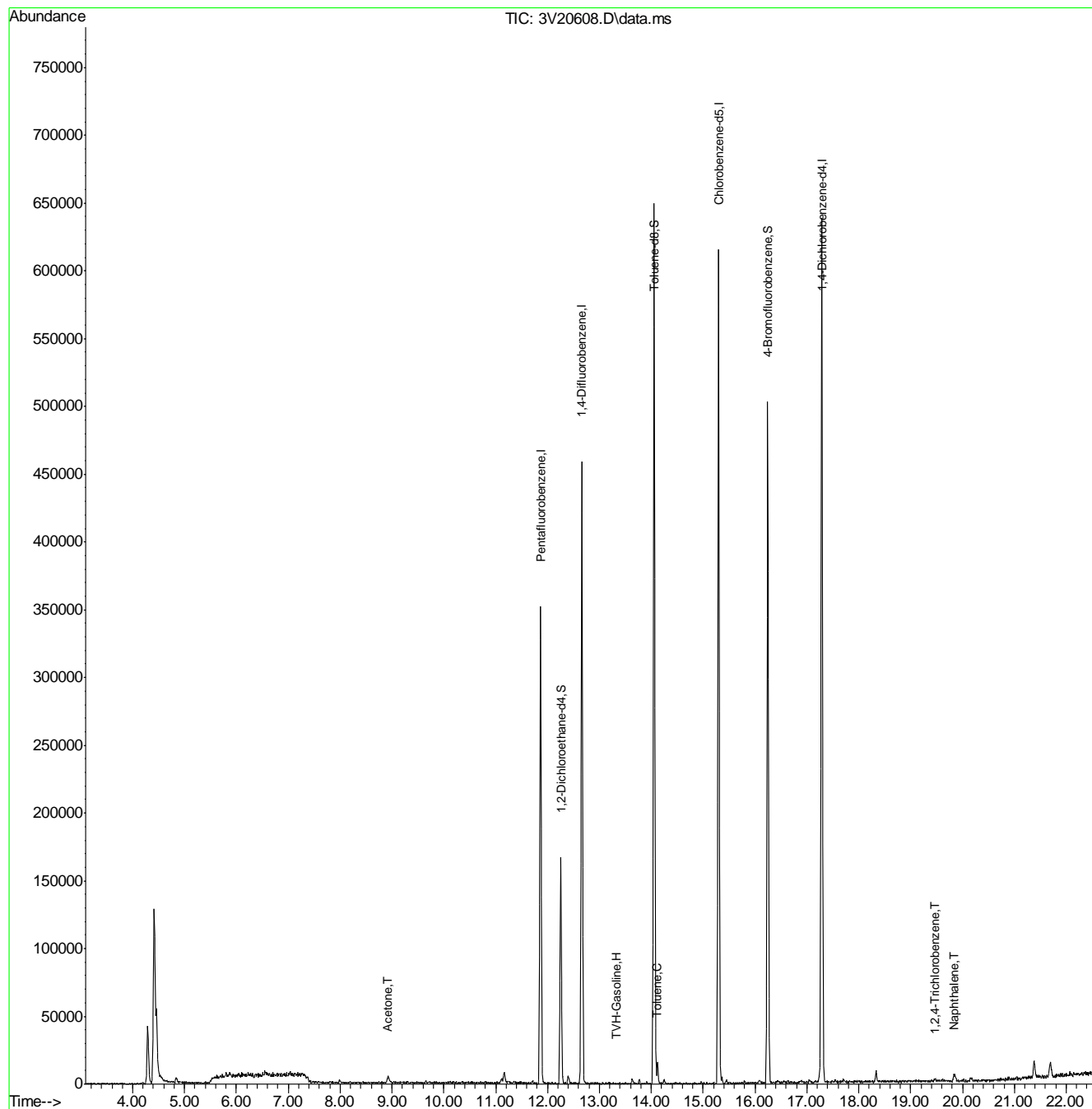
Target Compounds						Qvalue
1) TVH-Gasoline	13.329	TIC	6460m	0.23	ug/l	
15) Acetone	8.924	58	2648	0.80	ug/l	# 80
62) Toluene	14.115	92	3487	0.38	ug/l	100
90) 1,2,4-Trichlorobenzene	19.471	180	1322	0.29	ug/l	# 87
91) Naphthalene	19.840	128	8748	0.84	ug/l	100

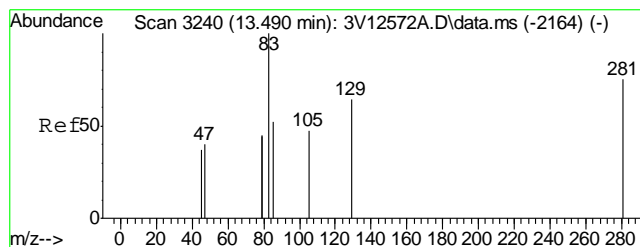
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V3092012.S\  
Data File : 3V20608.D  
Acq On : 20 Sep 2012 11:27 pm  
Operator : BRETD  
Sample : MB  
Misc : MS4691,V3V1202,5.00,,100,5,1  
ALS Vial : 28 Sample Multiplier: 1

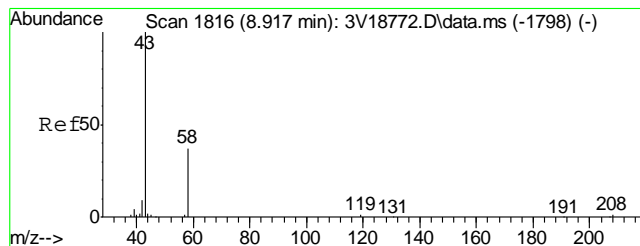
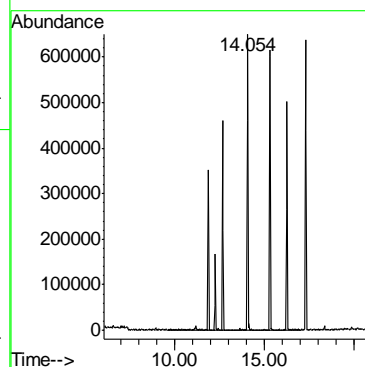
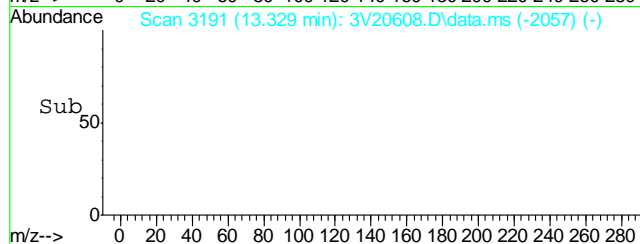
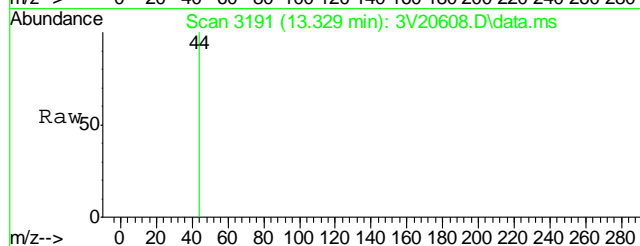
Quant Time: Sep 21 09:45:41 2012  
Quant Method : C:\msdchem\1\METHODS\V3AP1160TVH1160SOIL.M  
Quant Title : 8260  
QLast Update : Fri Aug 24 10:57:50 2012  
Response via : Initial Calibration





#1  
TVH-Gasoline  
Concen: 0.23 ug/l m  
RT: 13.329 min Scan# 3191  
Delta R.T. 0.000 min  
Lab File: 3V20608.D  
Acq: 20 Sep 2012 11:27 pm

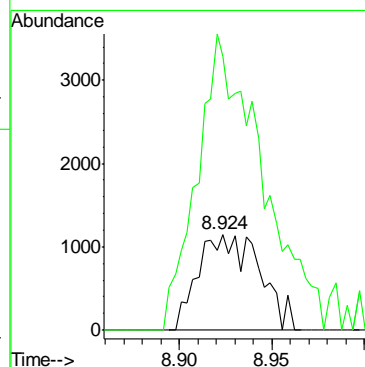
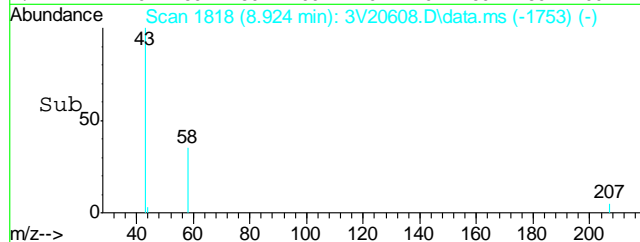
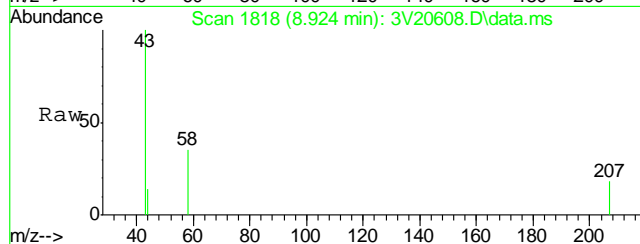
Tgt Ion:TIC Resp: 6460



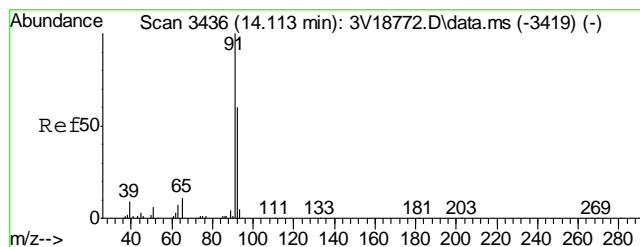
#15  
Acetone  
Concen: 0.80 ug/l  
RT: 8.924 min Scan# 1818  
Delta R.T. 0.010 min  
Lab File: 3V20608.D  
Acq: 20 Sep 2012 11:27 pm

Tgt Ion: 58 Resp: 2648

Ion	Ratio	Lower	Upper
58	100		
43	325.6	267.0	307.0#

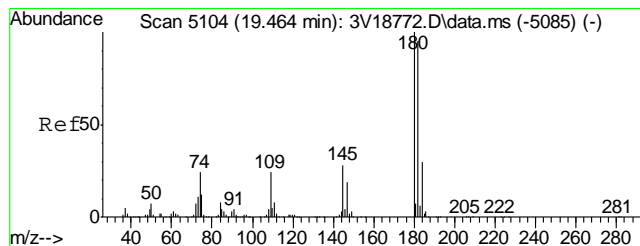
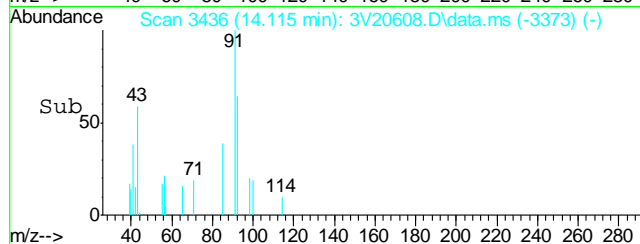
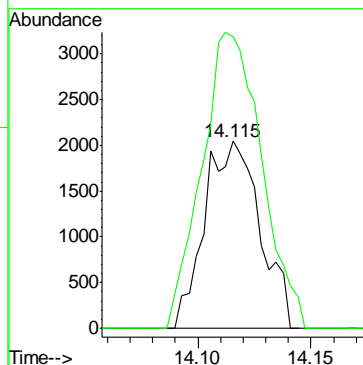
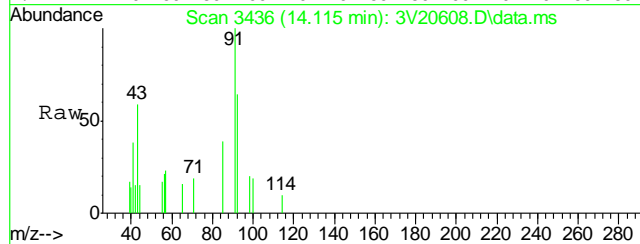






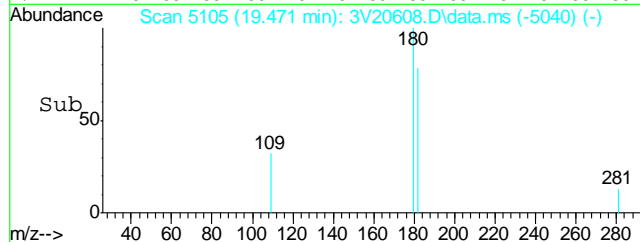
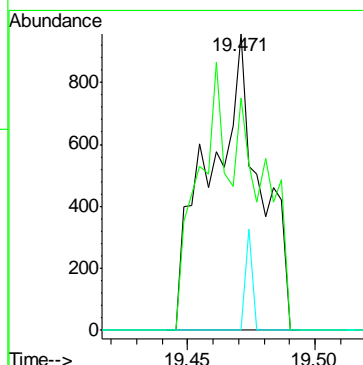
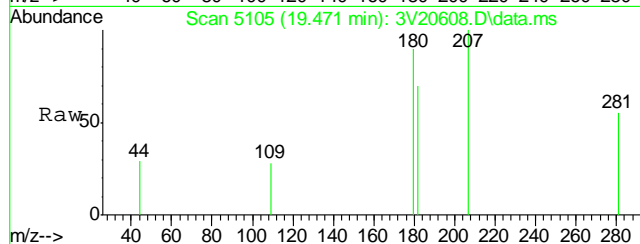
#62  
Toluene  
Concen: 0.38 ug/l  
RT: 14.115 min Scan# 3436  
Delta R.T. 0.003 min  
Lab File: 3V20608.D  
Acq: 20 Sep 2012 11:27 pm

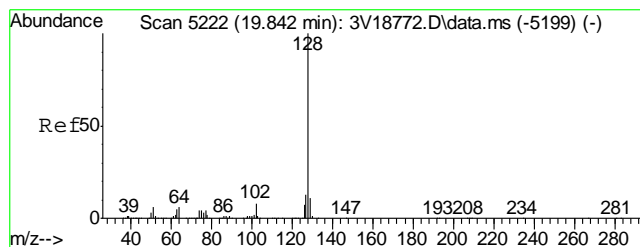
Tgt Ion: 92 Resp: 3487  
Ion Ratio Lower Upper  
92 100  
91 170.7 150.2 190.2



#90  
1,2,4-Trichlorobenzene  
Concen: 0.29 ug/l  
RT: 19.471 min Scan# 5105  
Delta R.T. 0.009 min  
Lab File: 3V20608.D  
Acq: 20 Sep 2012 11:27 pm

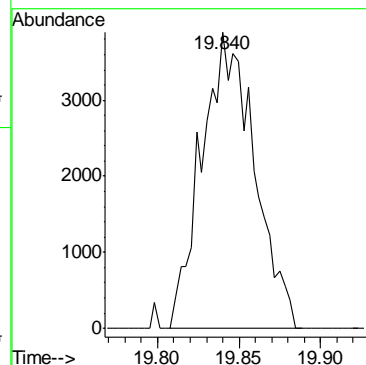
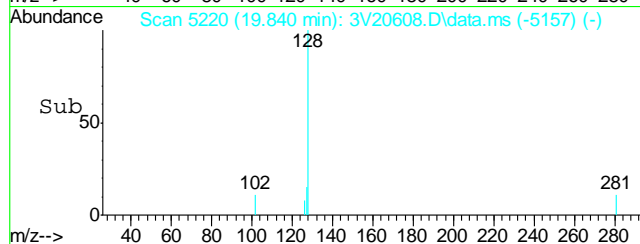
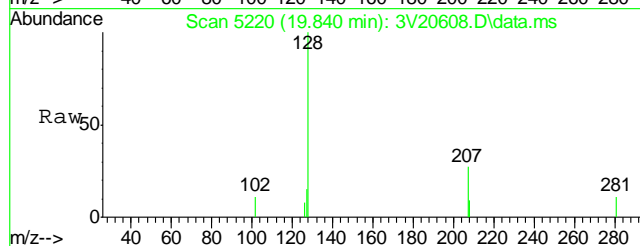
Tgt Ion: 180 Resp: 1322  
Ion Ratio Lower Upper  
180 100  
182 99.4 76.4 114.6  
145 4.8 22.9 34.3#





#91  
Naphthalene  
Concen: 0.84 ug/l  
RT: 19.840 min Scan# 5220  
Delta R.T. 0.003 min  
Lab File: 3V20608.D  
Acq: 20 Sep 2012 11:27 pm

Tgt Ion: 128 Resp: 8748



7.2.1

7

## GC/MS Semi-volatiles

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6679-MB	3G11337.D	1	09/21/12	DC	09/21/12	OP6679	E3G529

**The QC reported here applies to the following samples:****Method:** SW846 8270C BY SIM

D38940-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	8.3	4.3	ug/kg	
120-12-7	Anthracene	ND	8.3	4.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.3	4.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.3	4.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.3	4.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.3	4.3	ug/kg	
218-01-9	Chrysene	ND	8.3	4.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.3	4.3	ug/kg	
206-44-0	Fluoranthene	ND	8.3	4.3	ug/kg	
86-73-7	Fluorene	ND	8.3	4.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.3	4.3	ug/kg	
91-20-3	Naphthalene	ND	12	10	ug/kg	
129-00-0	Pyrene	ND	8.3	4.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
4165-60-0	Nitrobenzene-d5	91% 10-145%
321-60-8	2-Fluorobiphenyl	94% 10-130%
1718-51-0	Terphenyl-d14	101% 22-130%

8.1.1

8

## Blank Spike Summary

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6679-BS	3G11338.D	1	09/21/12	DC	09/21/12	OP6679	E3G529

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D38940-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	82.8	99	34-130
120-12-7	Anthracene	83.3	87.0	104	35-130
56-55-3	Benzo(a)anthracene	83.3	69.2	83	36-130
50-32-8	Benzo(a)pyrene	83.3	70.6	85	36-130
205-99-2	Benzo(b)fluoranthene	83.3	55.2	66	35-130
207-08-9	Benzo(k)fluoranthene	83.3	88.2	106	37-130
218-01-9	Chrysene	83.3	86.4	104	40-130
53-70-3	Dibenzo(a,h)anthracene	83.3	75.0	90	32-130
206-44-0	Fluoranthene	83.3	78.6	94	38-130
86-73-7	Fluorene	83.3	78.4	94	35-130
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	74.2	89	28-130
91-20-3	Naphthalene	83.3	86.6	104	35-130
129-00-0	Pyrene	83.3	81.0	97	37-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	93%	10-145%
321-60-8	2-Fluorobiphenyl	94%	10-130%
1718-51-0	Terphenyl-d14	97%	22-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6679-MS	3G11340.D	1	09/21/12	DC	09/21/12	OP6679	E3G529
OP6679-MSD	3G11341.D	1	09/21/12	DC	09/21/12	OP6679	E3G529
D38939-1	3G11339.D	1	09/21/12	DC	09/21/12	OP6679	E3G529

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D38940-1

CAS No.	Compound	D38939-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		89.8	73.1	81	64.3	72	13	10-155/30
120-12-7	Anthracene	ND		89.8	84.6	94	85.1	95	1	10-155/30
56-55-3	Benzo(a)anthracene	ND		89.8	74.2	83	79.2	88	7	10-175/30
50-32-8	Benzo(a)pyrene	ND		89.8	70.9	79	74.0	83	4	10-164/30
205-99-2	Benzo(b)fluoranthene	ND		89.8	59.8	67	65.3	73	9	10-165/30
207-08-9	Benzo(k)fluoranthene	ND		89.8	81.5	91	84.9	95	4	10-178/30
218-01-9	Chrysene	ND		89.8	83.7	93	86.7	97	4	10-147/30
53-70-3	Dibenzo(a,h)anthracene	ND		89.8	67.9	76	66.9	75	1	10-144/30
206-44-0	Fluoranthene	ND		89.8	82.5	92	87.3	97	6	10-207/30
86-73-7	Fluorene	ND		89.8	79.9	89	72.7	81	9	10-163/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		89.8	67.2	75	66.4	74	1	10-180/30
91-20-3	Naphthalene	ND		89.8	77.9	87	55.3	62	34* a	10-198/30
129-00-0	Pyrene	ND		89.8	84.2	94	88.5	99	5	10-189/30

CAS No.	Surrogate Recoveries	MS	MSD	D38939-1	Limits
4165-60-0	Nitrobenzene-d5	67%	51%	59%	10-145%
321-60-8	2-Fluorobiphenyl	68%	59%	63%	10-130%
1718-51-0	Terphenyl-d14	75%	82%	74%	22-130%

(a) Variability of recovery may be due to sample matrix/homogeneity.

\* = Outside of Control Limits.

GC/MS Semi-volatiles

Raw Data

6

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\092112\  
 Data File : 3g11342.D  
 Acq On : 21 Sep 2012 3:45 pm  
 Operator : DONC  
 Sample : D38940-1  
 Misc : OP6679,E3G529,30.04,,,1,1  
 ALS Vial : 9 Sample Multiplier: 1

Quant Time: Sep 24 12:18:39 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G511.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Thu Sep 06 09:42:23 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.921	136	170322	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.640	164	157911	4.0000	ug/mL	0.00
15) Phenanthrene-d10	9.121	188	153950	4.0000	ug/mL	0.00
19) Chrysene-d12	11.759	240	127007	4.0000	ug/mL	0.00
24) Perylene-d12	13.188	264	84551	4.0000	ug/mL	0.01

## System Monitoring Compounds

2) Nitrobenzene-d5	5.236	82	26153m	1.5607	ug/mL	0.01
Spiked Amount 50.000	Range 25 - 135		Recovery =	3.12%#		
7) 2-Fluorobiphenyl	6.966	172	1453258	22.1240	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	44.24%		
21) Terphenyl-d14	10.712	244	717313	37.4835	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	74.96%		

## Target Compounds

						Qvalue
3) N-Nitrosodimethylamine	0.000	74	0	N.D.	d	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d	
5) Naphthalene	5.946	128	31657	0.6679	ug/mL	87
8) 2-Methylnaphthalene	6.620	142	52109	1.1162	ug/mL#	72
9) 1-Methylnaphthalene	6.719	142	19346	0.4004	ug/mL#	73
10) Acenaphthylene	7.450	152	47522	0.5603	ug/mL	77
11) Acenaphthene	0.000	154	0	N.D.	d	
12) Dibenzofuran	0.000	168	0	N.D.	d	
13) Fluorene	0.000	166	0	N.D.	d	
14) Diphenylamine	0.000	169	0	N.D.	d	
16) Phenanthrene	9.144	178	29881	0.5533	ug/mL	68
17) Anthracene	0.000	178	0	N.D.	d	
18) Fluoranthene	0.000	202	0	N.D.	d	
20) Pyrene	0.000	202	0	N.D.	d	
22) Benzo(a)anthracene	0.000	228	0	N.D.	d	
23) Chrysene	11.779	228	5548	0.0972	ug/mL	83
25) Benzo(b)fluoranthene	0.000	252	0	N.D.	d	
26) Benzo(k)fluoranthene	0.000	252	0	N.D.	d	
27) Benzo(a)pyrene	0.000	252	0	N.D.	d	
28) Indeno(1,2,3-cd)pyrene	0.000	276	0	N.D.	d	
29) Dibenz(a,h)anthracene	0.000	278	0	N.D.	d	
30) Benzo(g,h,i)perylene	0.000	276	0	N.D.	d	

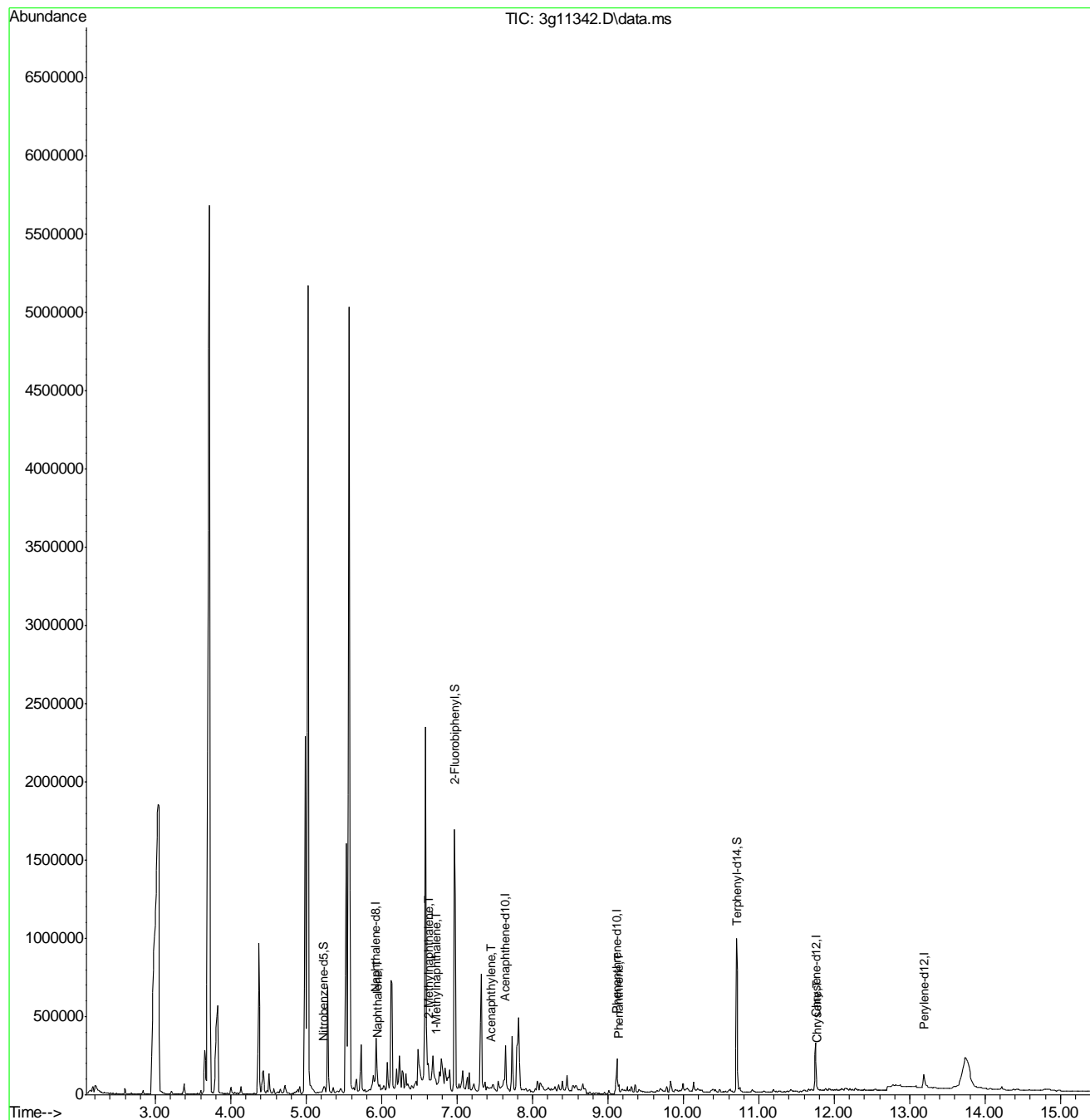
(#) = qualifier out of range (m) = manual integration (+) = signals summed

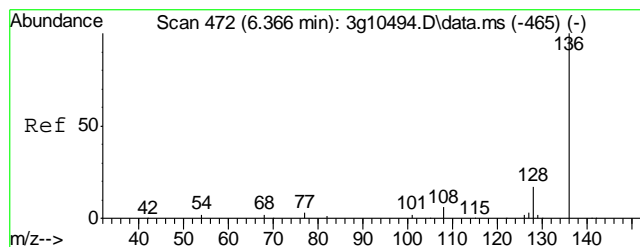


## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\092112\  
Data File : 3g11342.D  
Acq On : 21 Sep 2012 3:45 pm  
Operator : DONC  
Sample : D38940-1  
Misc : OP6679,E3G529,30.04,,,1,1  
ALS Vial : 9 Sample Multiplier: 1

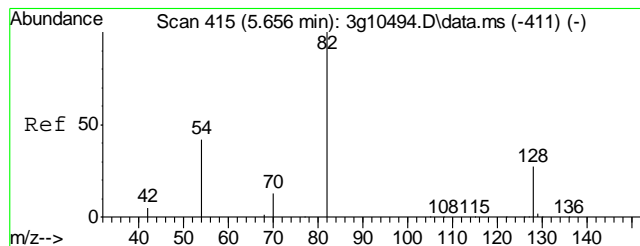
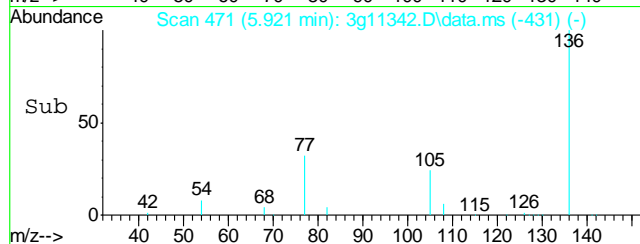
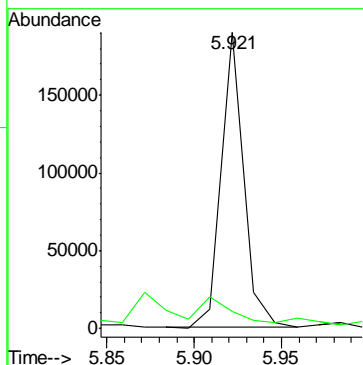
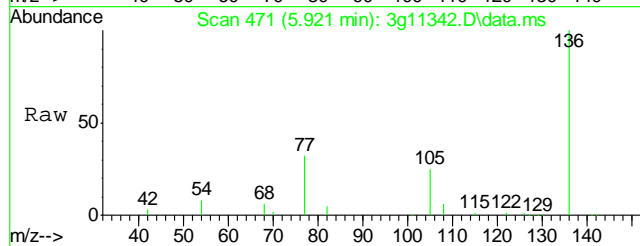
Quant Time: Sep 24 12:18:39 2012  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G511.M  
Quant Title : PAHSIM BASE  
QLast Update : Thu Sep 06 09:42:23 2012  
Response via : Initial Calibration





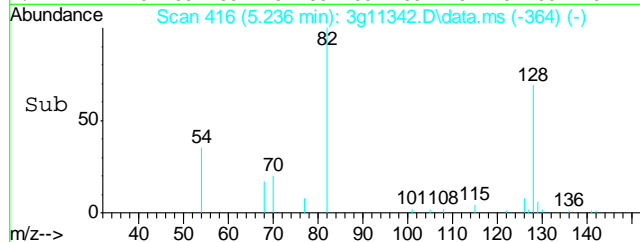
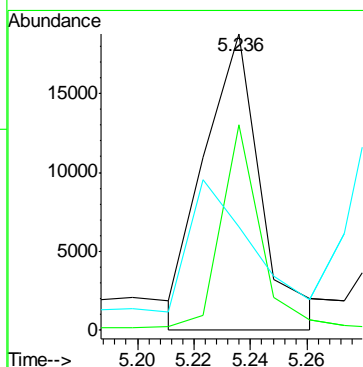
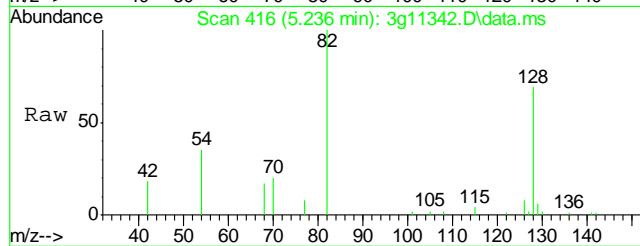
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.921 min Scan# 471  
Delta R.T. -0.000 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

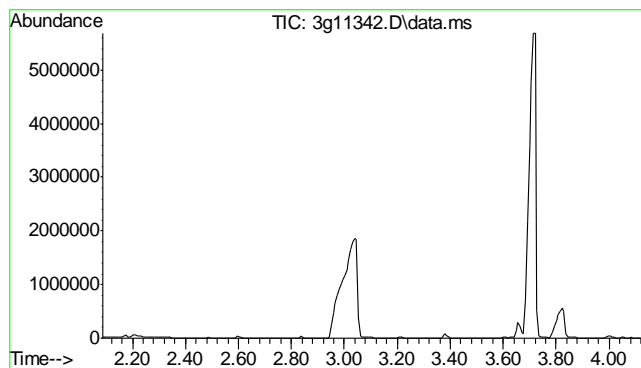
Tgt Ion	Ratio	Lower	Upper
136	100		
68	12.2	0.0	30.4



#2  
Nitrobenzene-d5  
Concen: 1.5607 ug/mL m  
RT: 5.236 min Scan# 416  
Delta R.T. 0.013 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

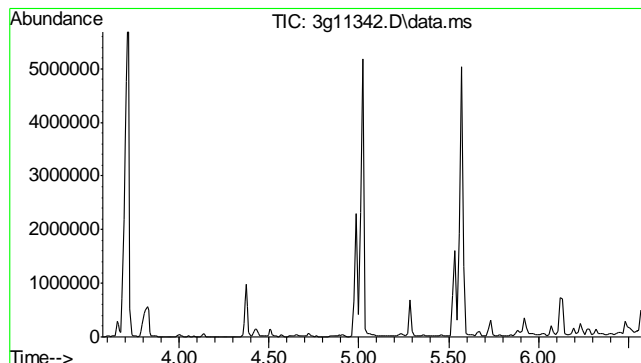
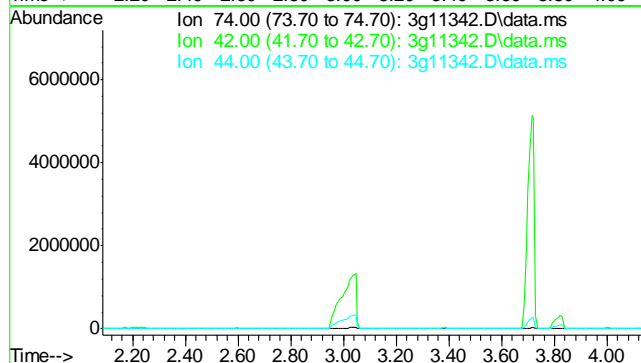
Tgt Ion	Ratio	Lower	Upper
82	100		
128	0.0	19.7	59.7#
54	5217.7	28.6	68.6#





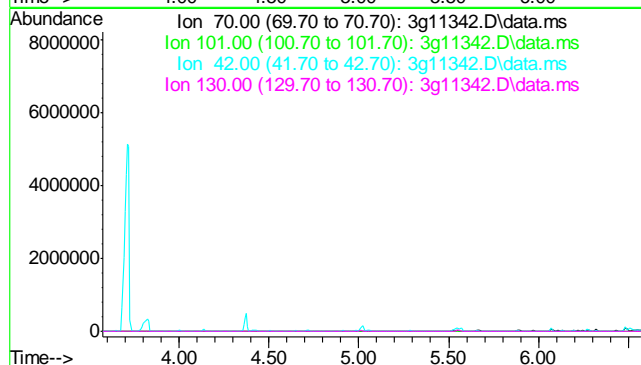
#3  
 N-Nitrosodimethylamine  
 Concen: N.D. ug/mL  
 Expected RT: 2.62 min  
 Lab File: 3g11342.D  
 Acq: 21 Sep 12 3:45 pm

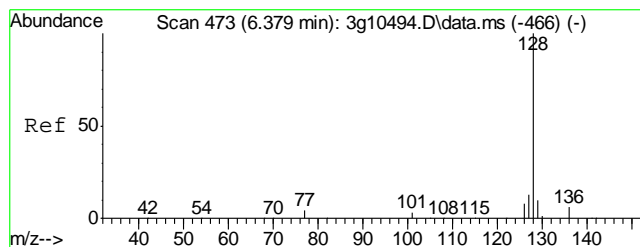
Tgt Ion	Exp Ratio
74	100
42	53.3
44	3.5



#4  
 N-Nitrosodi-propylamine  
 Concen: N.D. ug/mL  
 Expected RT: 5.07 min  
 Lab File: 3g11342.D  
 Acq: 21 Sep 12 3:45 pm

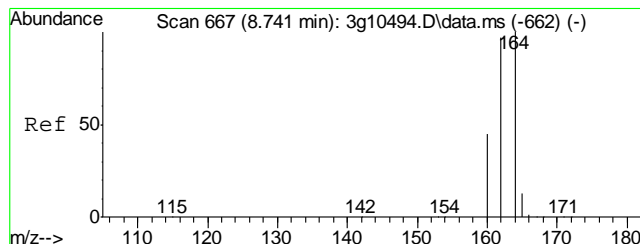
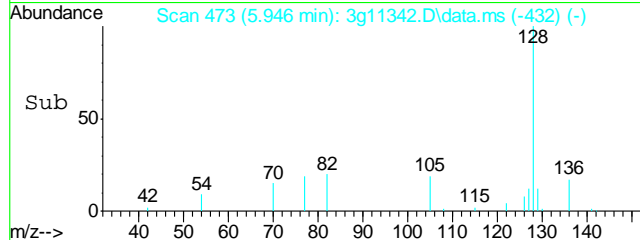
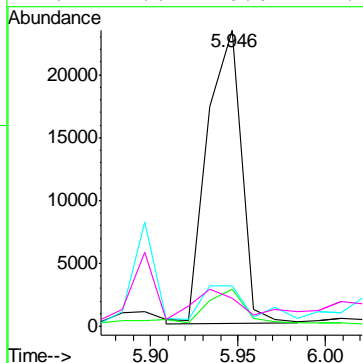
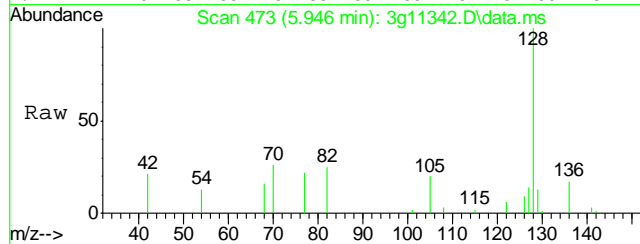
Tgt Ion	Exp Ratio
70	100
101	10.3
42	47.6
130	20.0





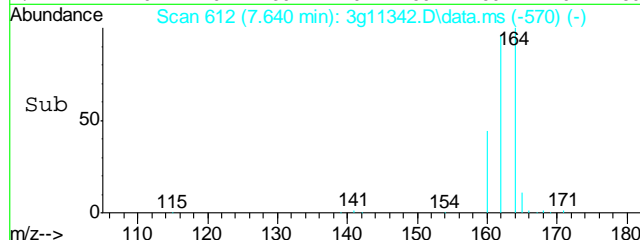
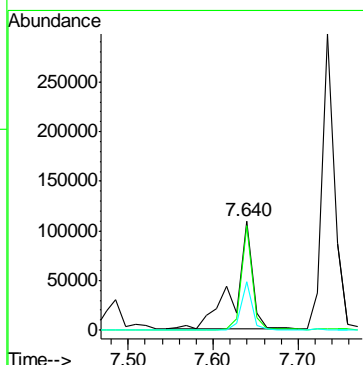
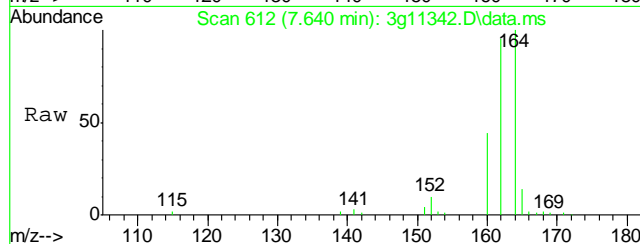
#5  
Naphthalene  
Concen: 0.6679 ug/mL  
RT: 5.946 min Scan# 473  
Delta R.T. 0.012 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

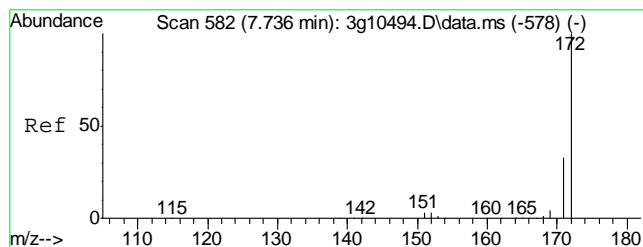
Tgt Ion:128	Resp:	31657
Ion Ratio	Lower	Upper
128	100	
129	16.6	0.0 30.8
127	18.1	0.0 33.4
126	12.6	0.0 27.7



#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.640 min Scan# 612  
Delta R.T. -0.000 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

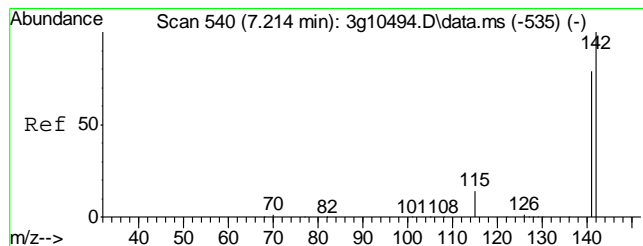
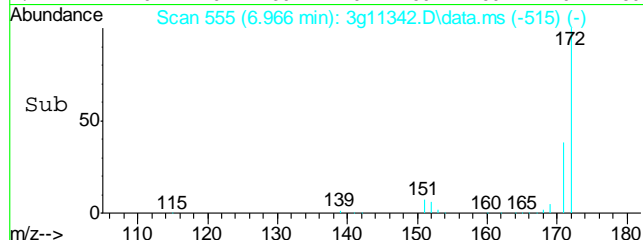
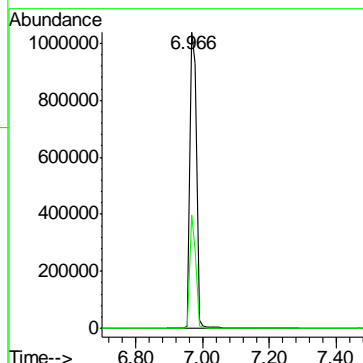
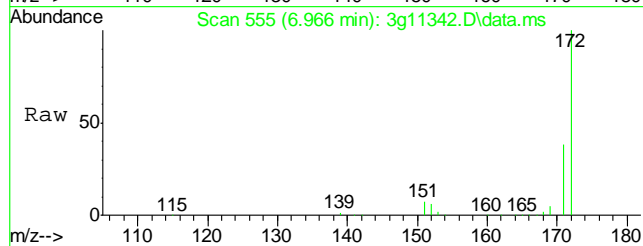
Tgt Ion:164	Resp:	157911
Ion Ratio	Lower	Upper
164	100	
162	58.8	73.5 113.5#
160	27.4	21.8 61.8





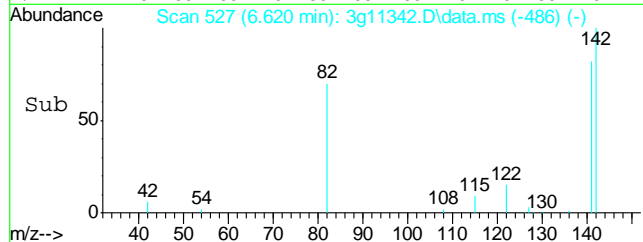
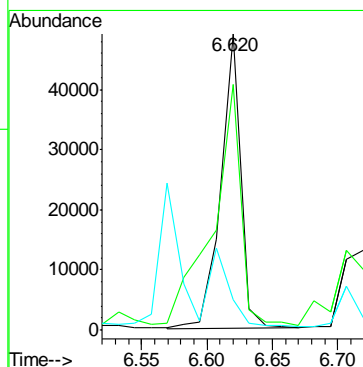
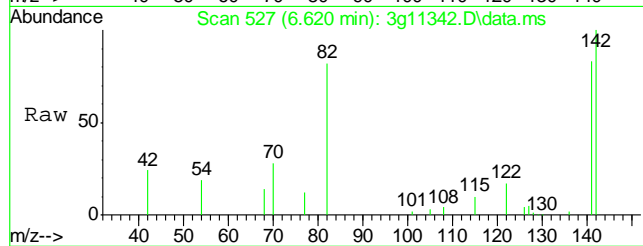
#7  
2-Fluorobiphenyl  
Concen: 22.1240 ug/mL  
RT: 6.966 min Scan# 555  
Delta R.T. -0.000 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

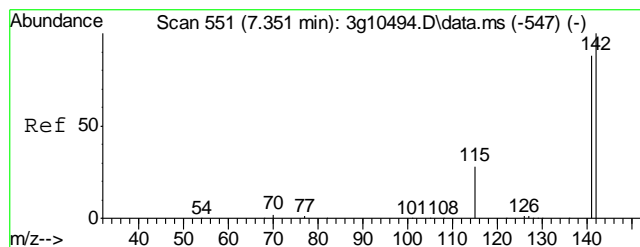
Tgt Ion	Ratio	Lower	Upper
172	100		
171	34.1	13.6	53.6



#8  
2-Methylnaphthalene  
Concen: 1.1162 ug/mL  
RT: 6.620 min Scan# 527  
Delta R.T. 0.012 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

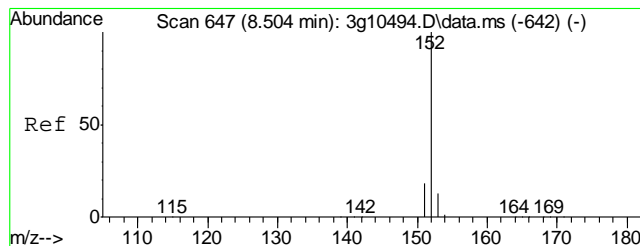
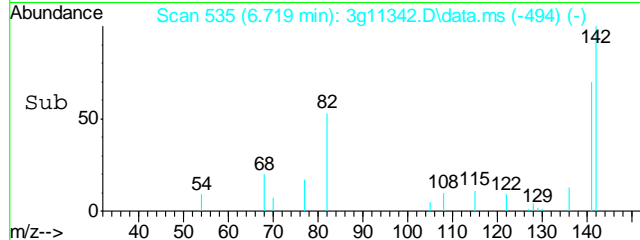
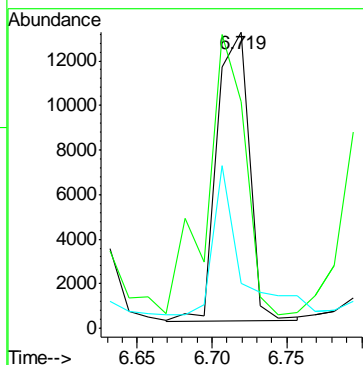
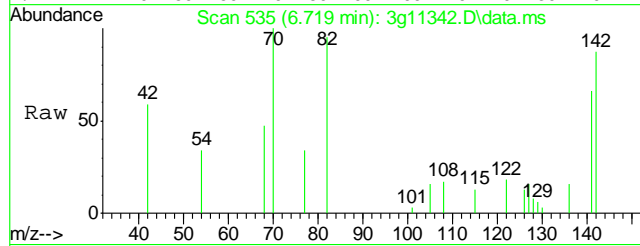
Tgt Ion	Ratio	Lower	Upper
142	100		
141	115.7	64.5	104.5#
115	26.5	13.6	53.6





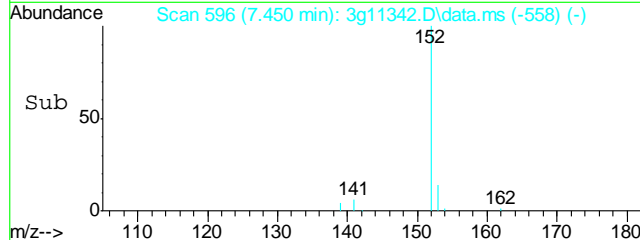
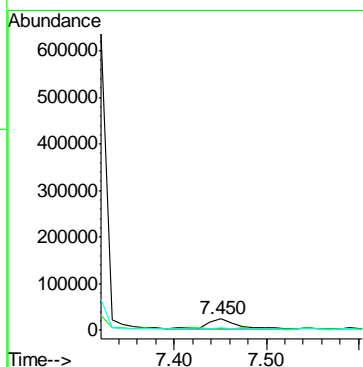
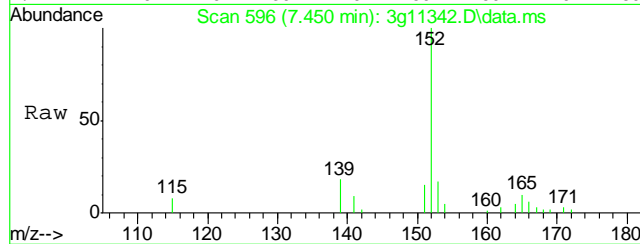
#9  
1-Methylnaphthalene  
Concen: 0.4004 ug/mL  
RT: 6.719 min Scan# 535  
Delta R.T. 0.012 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

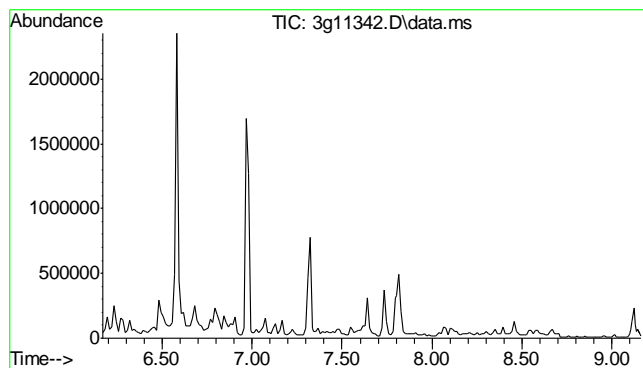
Tgt Ion	Ratio	Lower	Upper
142	100		
141	114.1	67.8	107.8#
115	44.7	11.0	51.0



#10  
Acenaphthylene  
Concen: 0.5603 ug/mL  
RT: 7.450 min Scan# 596  
Delta R.T. -0.047 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

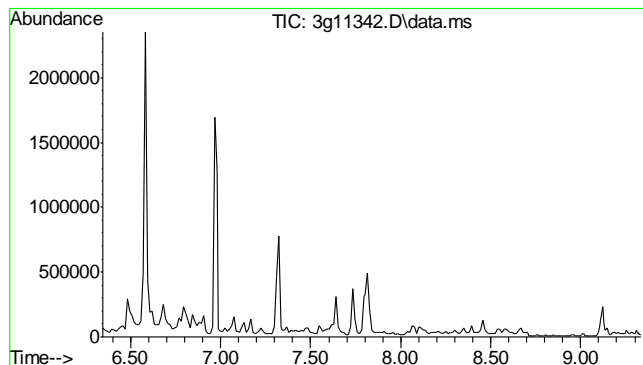
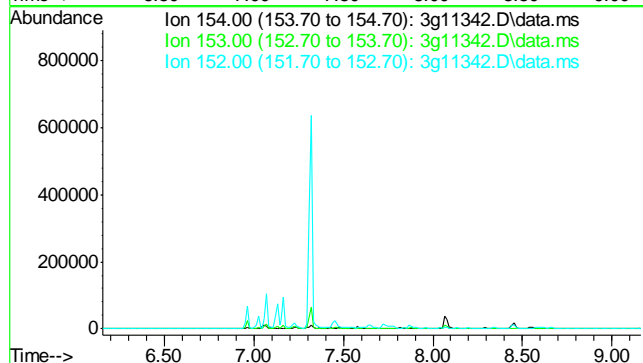
Tgt Ion	Ratio	Lower	Upper
152	100		
151	4.9	0.0	39.2
153	17.7	0.0	33.2





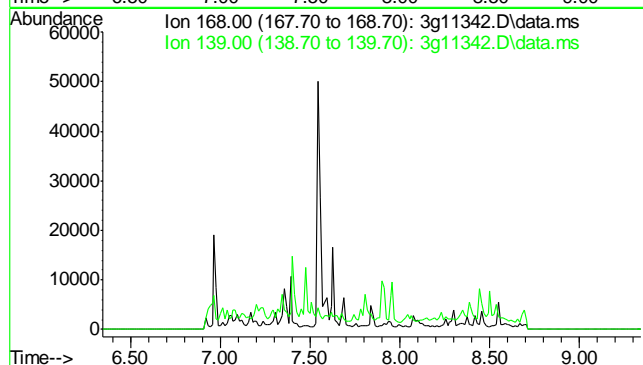
#11  
Acenaphthene  
Concen: N.D. ug/mL  
Expected RT: 7.66 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

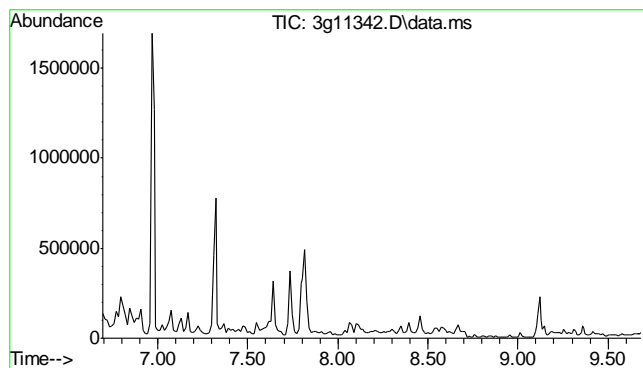
Tgt Ion	Exp Ratio
154	100
153	104.8
152	49.9



#12  
Dibenzofuran  
Concen: N.D. ug/mL  
Expected RT: 7.84 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

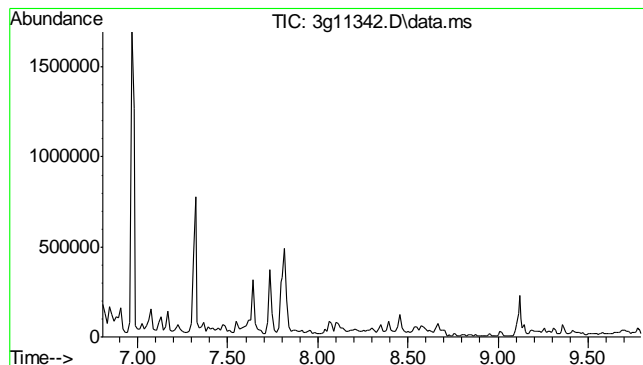
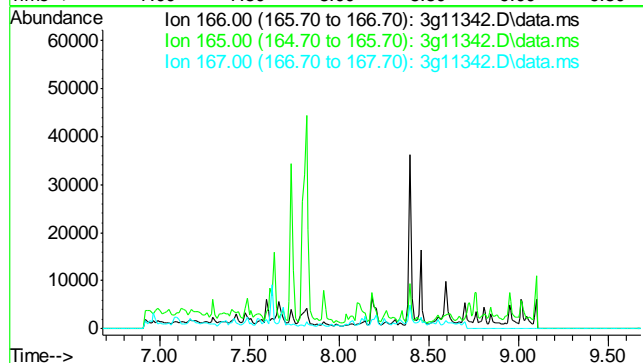
Tgt Ion	Exp Ratio
168	100
139	27.6





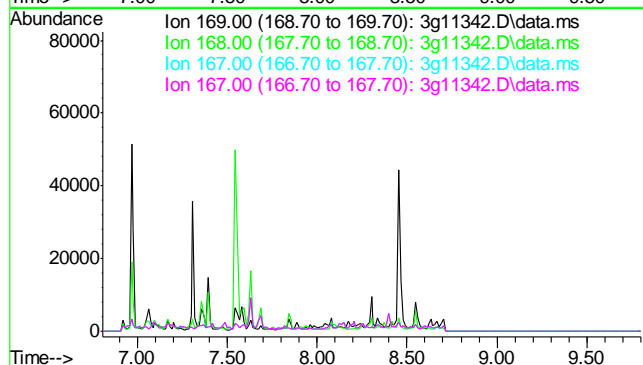
#13  
 Fluorene  
 Concen: N.D. ug/mL  
 Expected RT: 8.18 min  
  
 Lab File: 3g11342.D  
 Acq: 21 Sep 12 3:45 pm

Tgt Ion	Exp Ratio
166	100
165	91.1
167	13.3

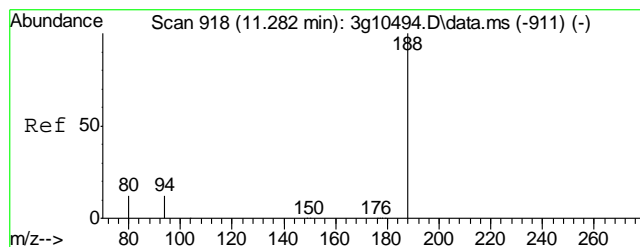


#14  
 Diphenylamine  
 Concen: N.D. ug/mL  
 Expected RT: 8.30 min  
  
 Lab File: 3g11342.D  
 Acq: 21 Sep 12 3:45 pm

Tgt Ion	Exp Ratio
169	100
168	61.0
167	32.9
167	32.9

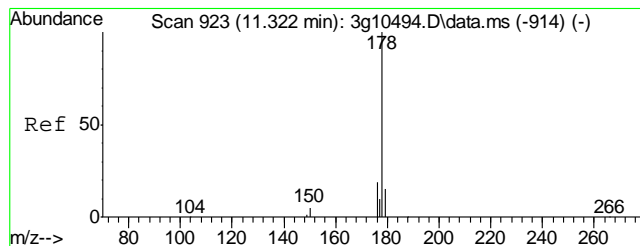
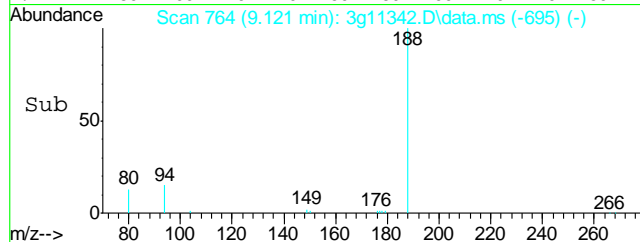
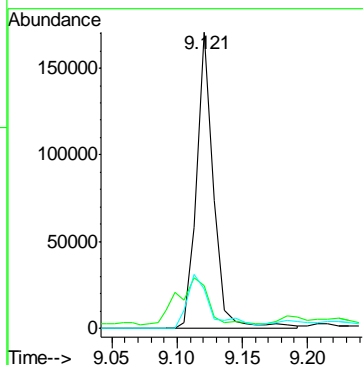
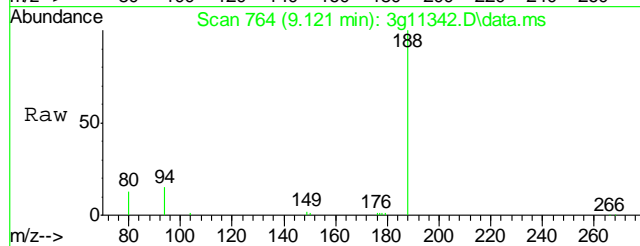






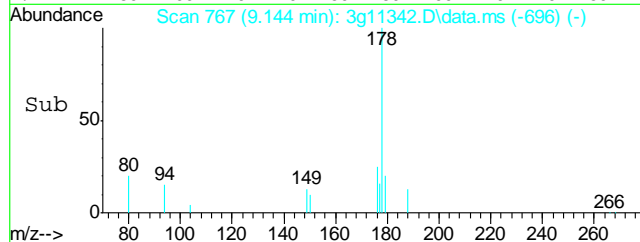
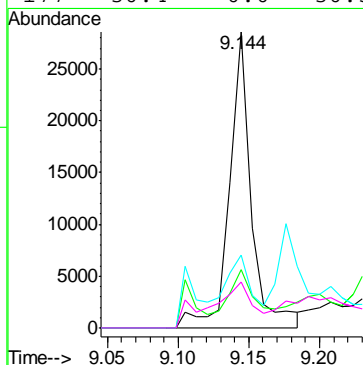
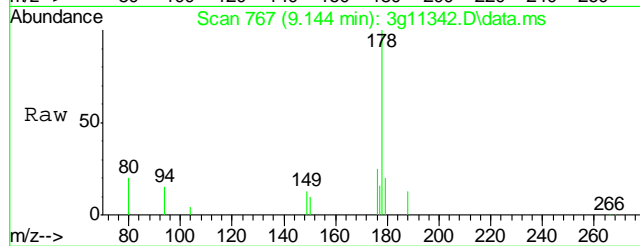
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 9.121 min Scan# 764  
Delta R.T. -0.000 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

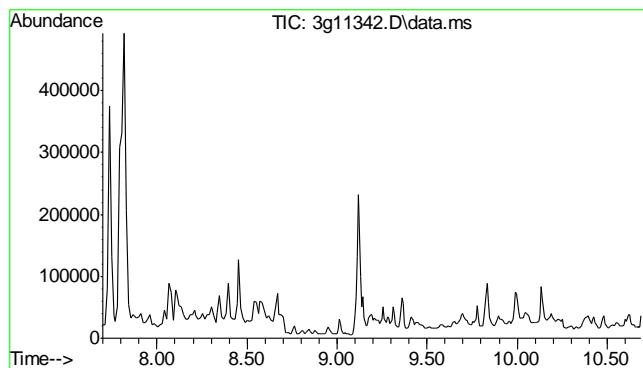
Tgt Ion:188	Resp: 153950
Ion Ratio	Lower Upper
188 100	
94 28.8	0.0 33.9
80 25.4	0.0 35.5



#16  
Phenanthrene  
Concen: 0.5533 ug/mL  
RT: 9.144 min Scan# 767  
Delta R.T. 0.008 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

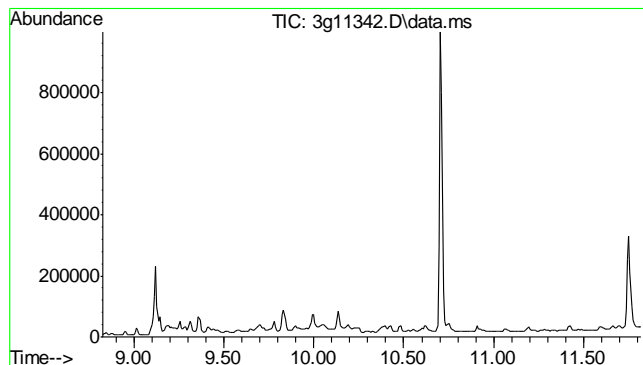
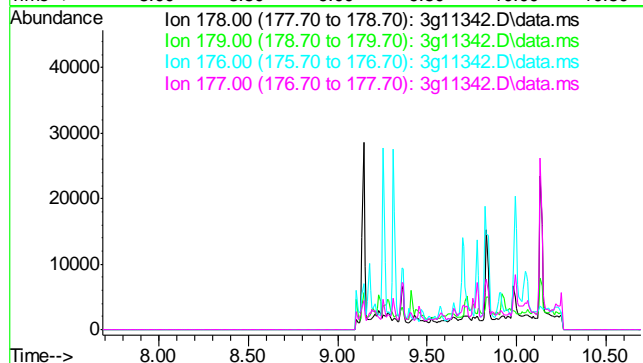
Tgt Ion:178	Resp: 29881
Ion Ratio	Lower Upper
178 100	
179 24.3	0.0 35.3
176 31.3	0.0 38.5
177 30.4	0.0 30.5





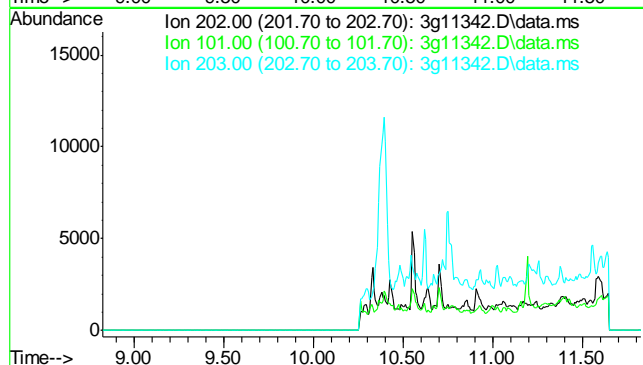
#17  
 Anthracene  
 Concen: N.D. ug/mL  
 Expected RT: 9.19 min  
  
 Lab File: 3g11342.D  
 Acq: 21 Sep 12 3:45 pm

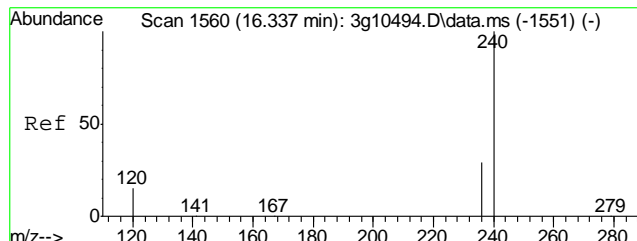
Tgt Ion	Sig	Exp Ratio
178	100	
179	15.2	
176	17.7	
177	9.0	



#18  
 Fluoranthene  
 Concen: N.D. ug/mL  
 Expected RT: 10.32 min  
  
 Lab File: 3g11342.D  
 Acq: 21 Sep 12 3:45 pm

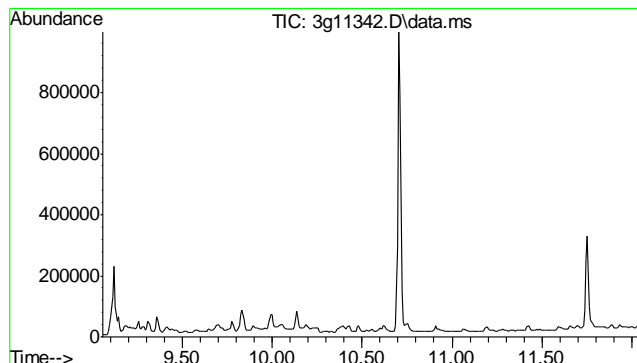
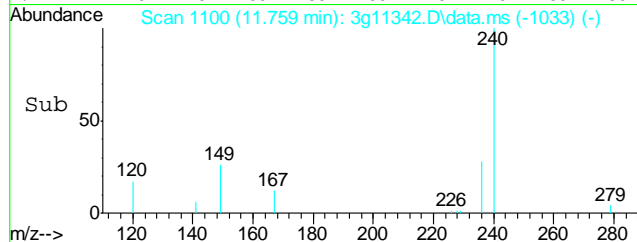
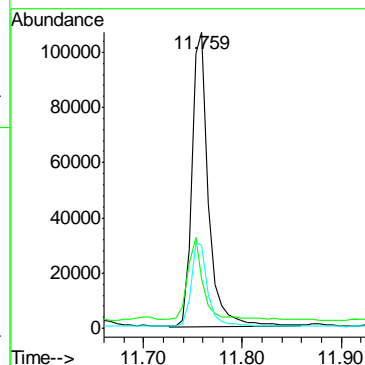
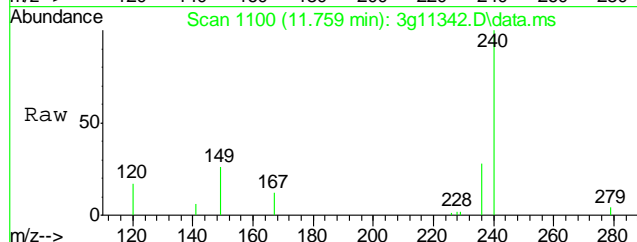
Tgt Ion	Sig	Exp Ratio
202	100	
101	13.0	
203	17.4	





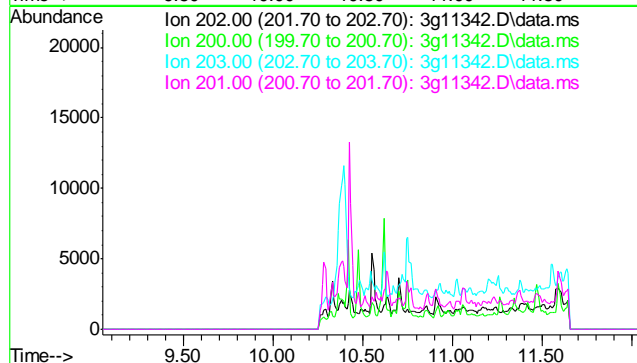
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.759 min Scan# 1100  
Delta R.T. 0.006 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

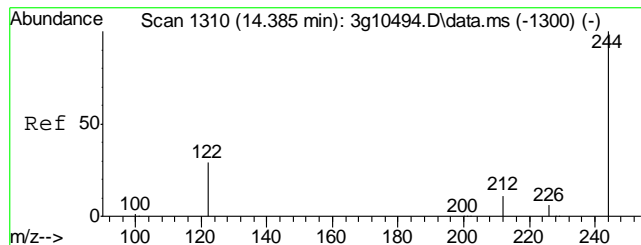
Tgt Ion:	240	Resp:	127007
Ion Ratio	Lower	Upper	
240	100		
120	30.9	0.0	36.2
236	28.7	8.8	48.8



#20  
Pyrene  
Concen: N.D. ug/mL  
Expected RT: 10.55 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

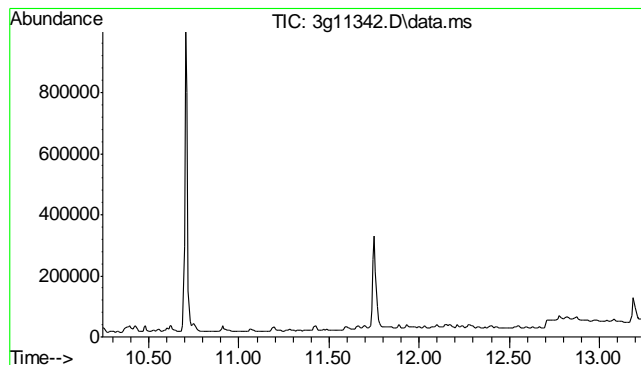
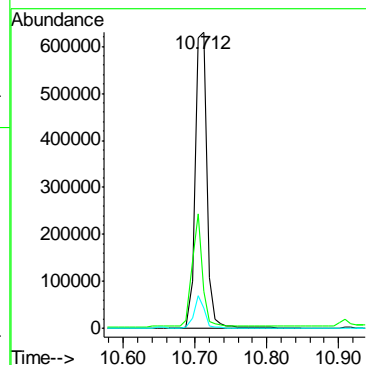
Tgt Ion:	202
Sig	Exp Ratio
202	100
200	20.1
203	17.8
201	16.6





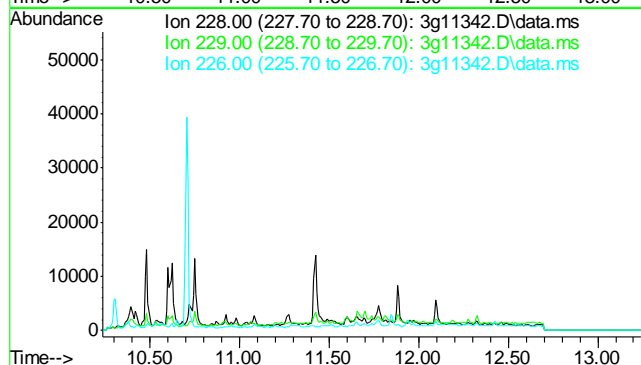
#21  
Terphenyl-d14  
Concen: 37.4835 ug/mL  
RT: 10.712 min Scan# 965  
Delta R.T. 0.008 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

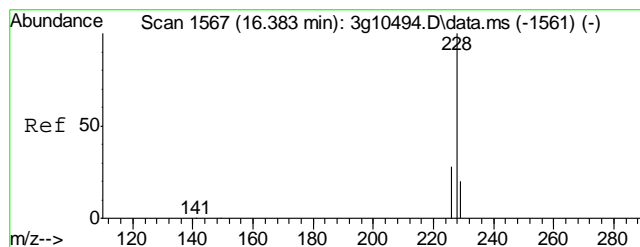
Tgt Ion	Ratio	Lower	Upper
244	100		
122	32.7	1.3	41.3
212	9.3	0.0	28.8



#22  
Benzo(a)anthracene  
Concen: N.D. ug/mL  
Expected RT: 11.74 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

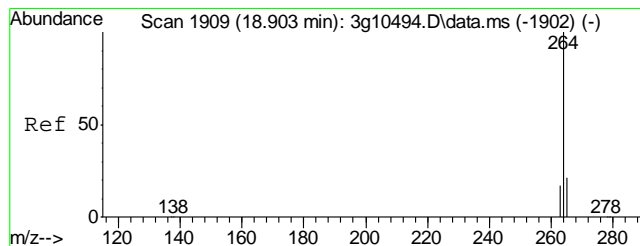
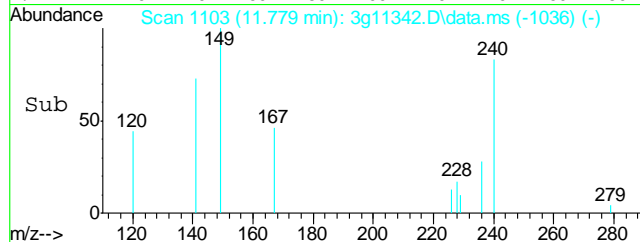
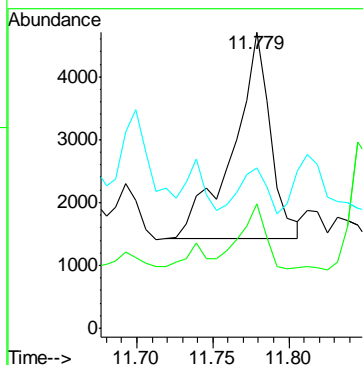
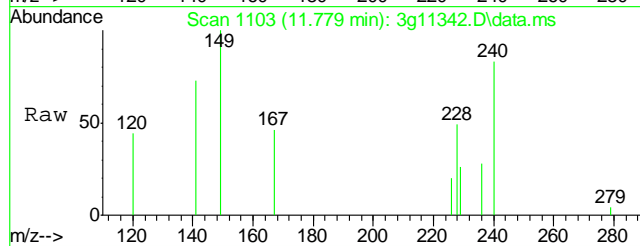
Tgt Ion	Sig	Exp Ratio
228	100	
229	19.6	
226	26.6	





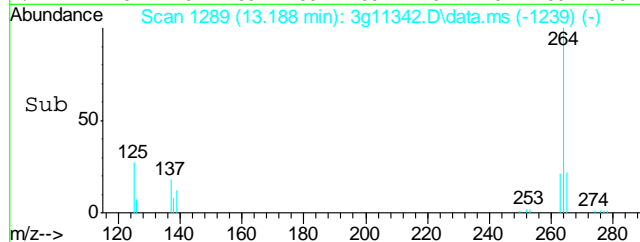
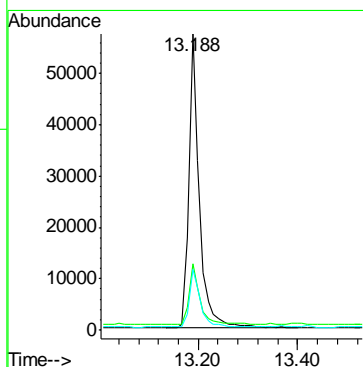
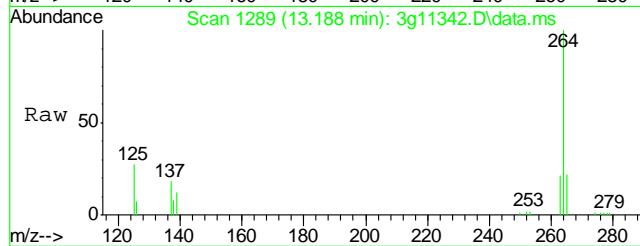
#23  
Chrysene  
Concen: 0.0972 ug/mL  
RT: 11.779 min Scan# 1103  
Delta R.T. 0.006 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

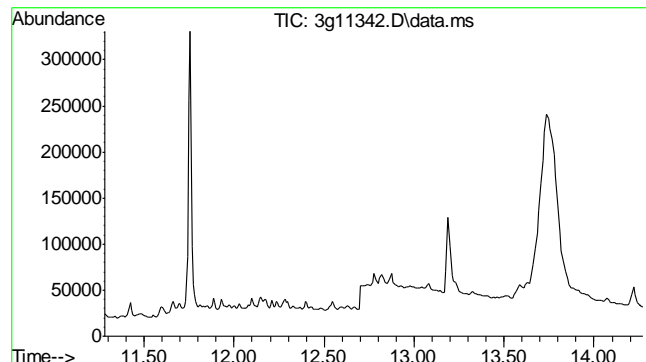
Tgt Ion:	228	Resp:	5548
Ion Ratio	Lower	Upper	
228	100		
226	27.5	8.6	48.6
229	36.8	0.0	39.4



#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 13.188 min Scan# 1289  
Delta R.T. 0.010 min  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

Tgt Ion:	264	Resp:	84551
Ion Ratio	Lower	Upper	
264	100		
265	21.7	1.0	41.0
263	20.7	0.0	39.0

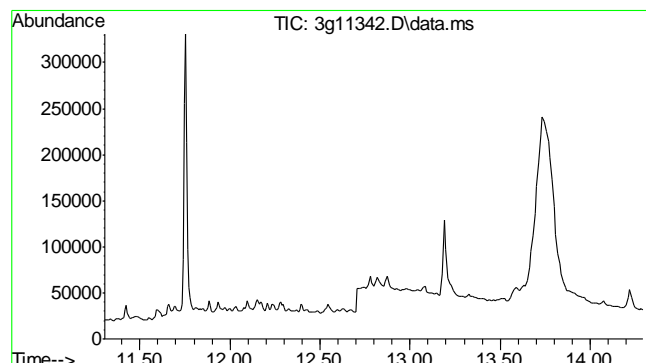
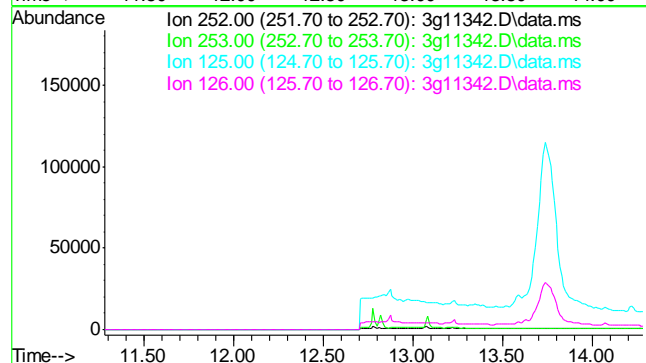




#25  
Benzo(b)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.78 min

Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

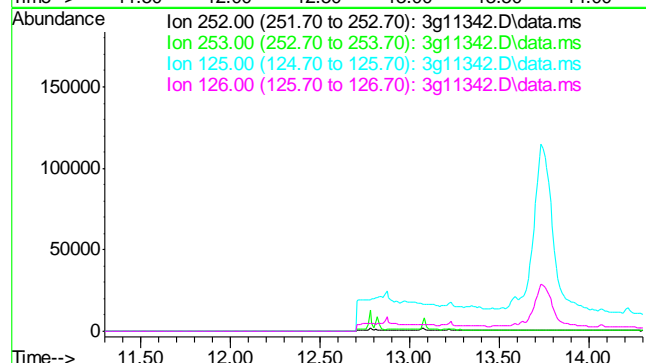
Tgt Ion: 252
Sig Exp Ratio
252 100
253 22.9
125 11.5
126 14.7

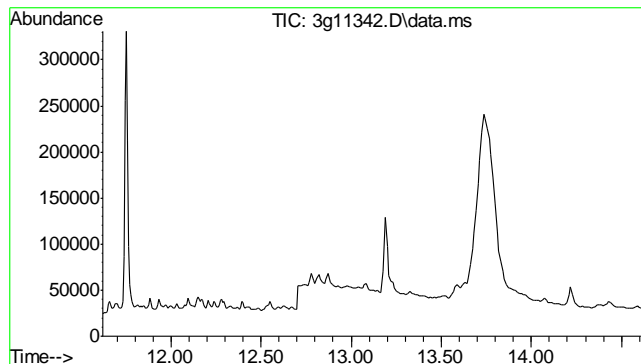


#26  
Benzo(k)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.80 min

Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

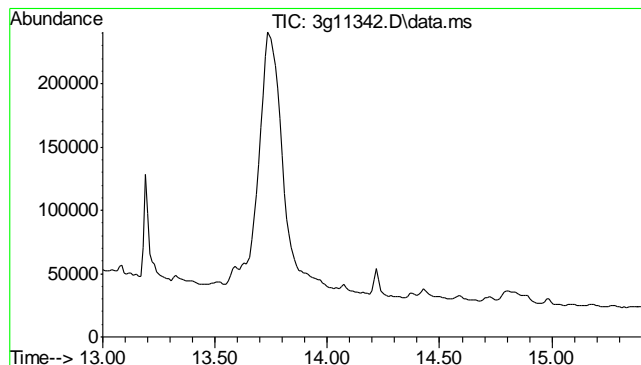
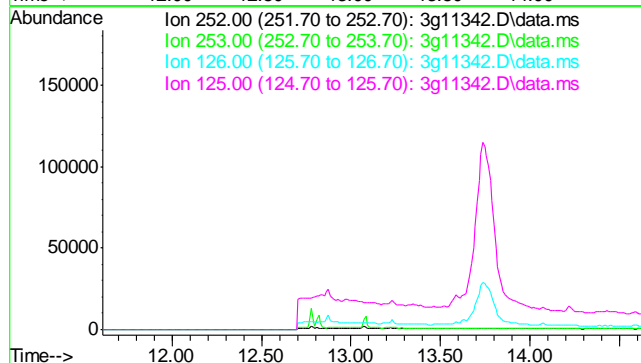
Tgt Ion: 252
Sig Exp Ratio
252 100
253 21.8
125 11.0
126 14.0





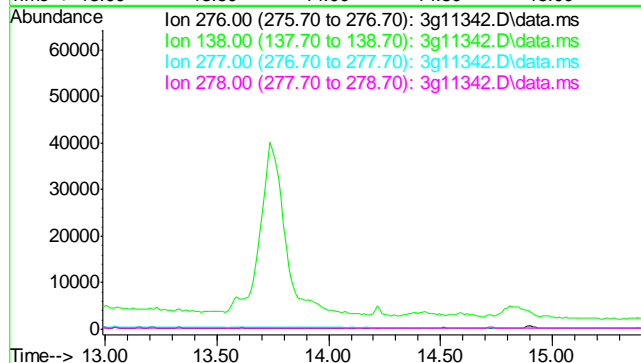
#27  
Benzo(a)pyrene  
Concen: N.D. ug/mL  
Expected RT: 13.11 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

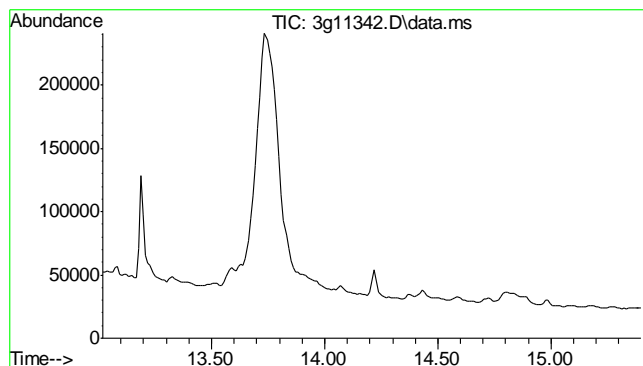
Tgt Ion:	252
Sig	Exp Ratio
252	100
253	21.4
126	13.6
125	10.7



#28  
Indeno(1,2,3-cd)pyrene  
Concen: N.D. ug/mL  
Expected RT: 14.49 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

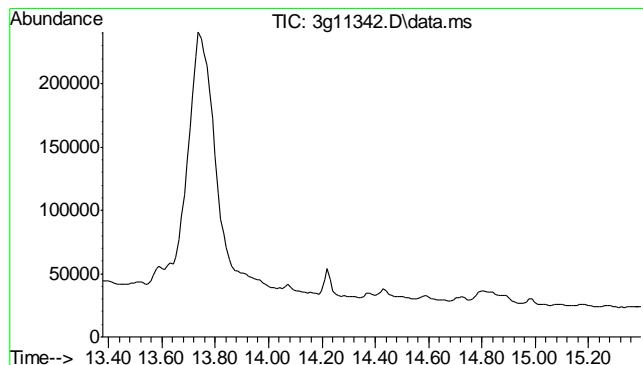
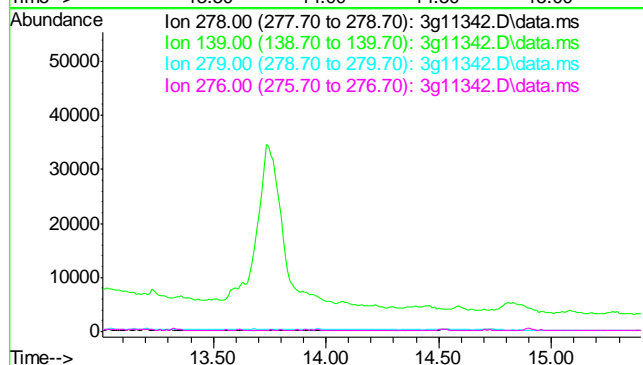
Tgt Ion:	276
Sig	Exp Ratio
276	100
138	25.3
277	25.0
278	79.3





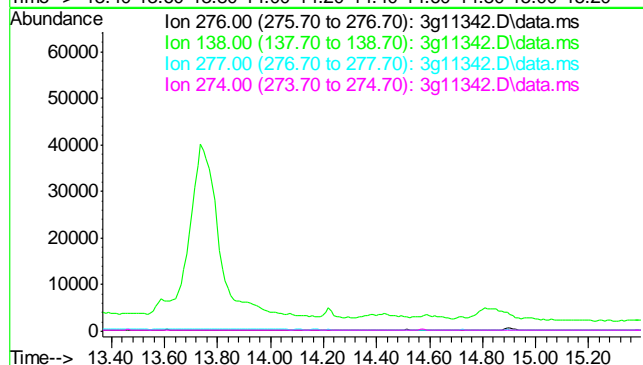
#29  
Dibenz(a,h)anthracene  
Concen: N.D. ug/mL  
Expected RT: 14.51 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

Tgt Ion	Exp Ratio
278	100
139	18.4
279	23.1
276	126.1



#30  
Benzo(g,h,i)perylene  
Concen: N.D. ug/mL  
Expected RT: 14.87 min  
  
Lab File: 3g11342.D  
Acq: 21 Sep 12 3:45 pm

Tgt Ion	Exp Ratio
276	100
138	21.3
277	23.4
274	21.3





## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\092412\  
 Data File : 3g11380.D  
 Acq On : 24 Sep 2012 10:25 pm  
 Operator : DONC  
 Sample : D38940-1CF  
 Misc : OP6688,E3G531,30.00,,,1,1  
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Sep 25 10:29:41 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G511.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Thu Sep 06 09:42:23 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.922	136	190124	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.640	164	123085	4.0000	ug/mL	0.00
15) Phenanthrene-d10	9.121	188	161545	4.0000	ug/mL	0.00
19) Chrysene-d12	11.759	240	127772	4.0000	ug/mL	0.00
24) Perylene-d12	13.188	264	72844	4.0000	ug/mL	0.01

## System Monitoring Compounds

2) Nitrobenzene-d5	5.298	82	76010m	4.0634	ug/mL	0.08
Spiked Amount 50.000	Range 25 - 135		Recovery =	8.12%#		
7) 2-Fluorobiphenyl	6.966	172	773908	15.1153	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	30.24%		
21) Terphenyl-d14	10.712	244	341385m	17.7324	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	35.46%		

## Target Compounds

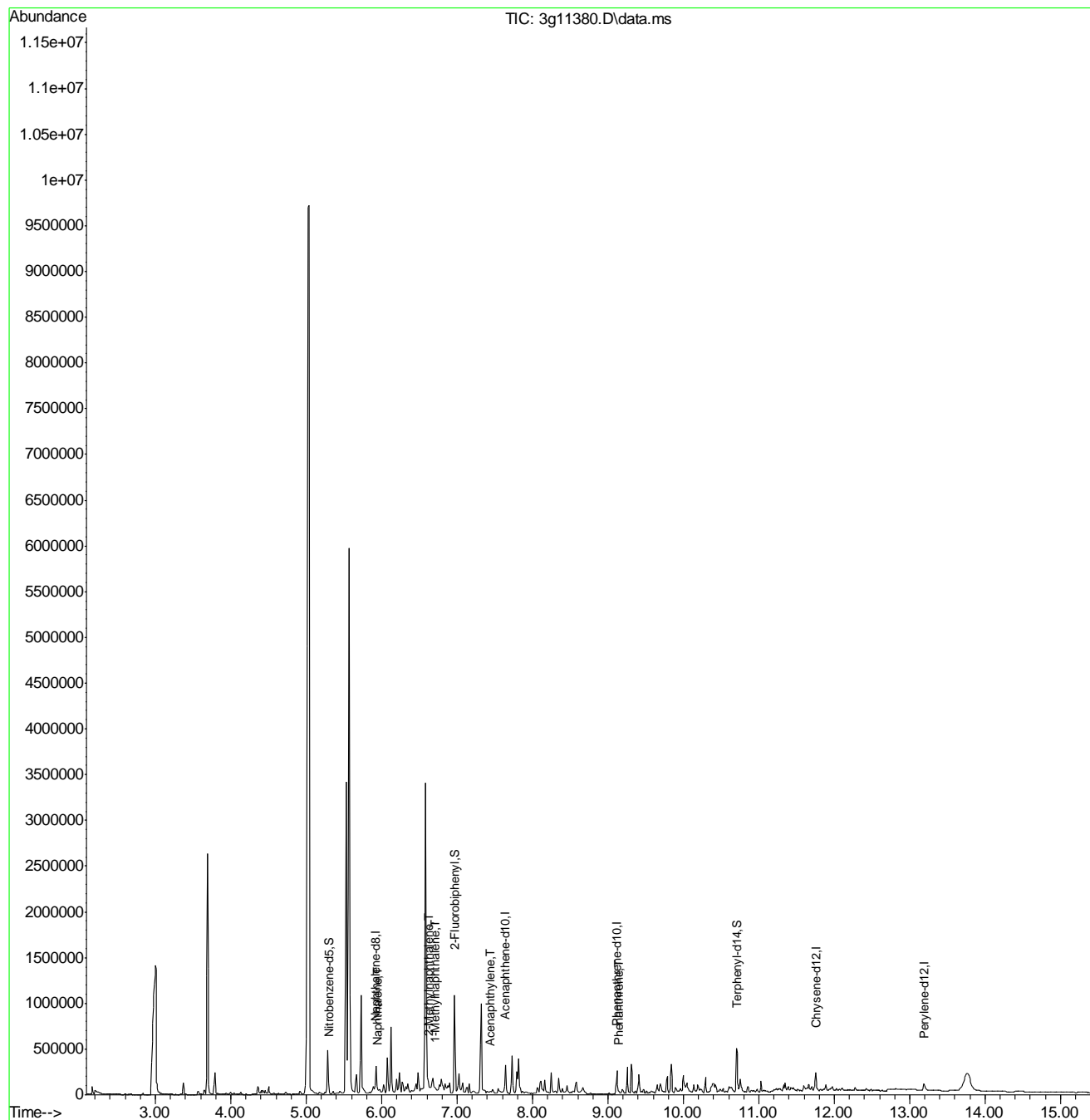
						Qvalue
3) N-Nitrosodimethylamine	0.000	74	0	N.D.	d	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d	
5) Naphthalene	5.946	128	17065	0.3225	ug/mL	87
8) 2-Methylnaphthalene	6.620	142	26388	0.7252	ug/mL#	22
9) 1-Methylnaphthalene	6.707	142	10640	0.2825	ug/mL#	42
10) Acenaphthylene	7.439	152	34068	0.5154	ug/mL	85
11) Acenaphthene	0.000	154	0	N.D.	d	
12) Dibenzofuran	0.000	168	0	N.D.	d	
13) Fluorene	0.000	166	0	N.D.	d	
14) Diphenylamine	0.000	169	0	N.D.	d	
16) Phenanthrene	9.145	178	13374	0.2360	ug/mL#	55
17) Anthracene	9.200	178	2621	N.D.		
18) Fluoranthene	0.000	202	0	N.D.	d	
20) Pyrene	0.000	202	0	N.D.	d	
22) Benzo(a)anthracene	0.000	228	0	N.D.	d	
23) Chrysene	0.000	228	0	N.D.	d	
25) Benzo(b)fluoranthene	12.778	252	2014	N.D.		
26) Benzo(k)fluoranthene	12.778	252	2014	N.D.		
27) Benzo(a)pyrene	13.209	252	2362	N.D.		
28) Indeno(1,2,3-cd)pyrene	14.461	276	292	N.D.		
29) Dibenz(a,h)anthracene	14.513	278	212	N.D.		
30) Benzo(g,h,i)perylene	14.892	276	729	N.D.		

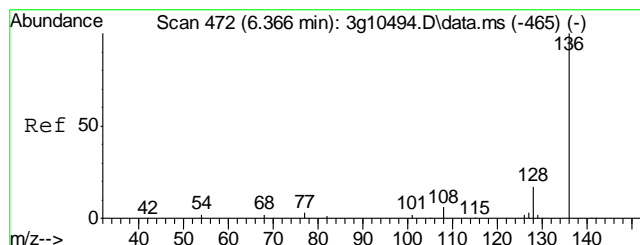
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\092412\  
Data File : 3g11380.D  
Acq On : 24 Sep 2012 10:25 pm  
Operator : DONC  
Sample : D38940-1CF  
Misc : OP6688,E3G531,30.00,,,1,1  
ALS Vial : 21 Sample Multiplier: 1

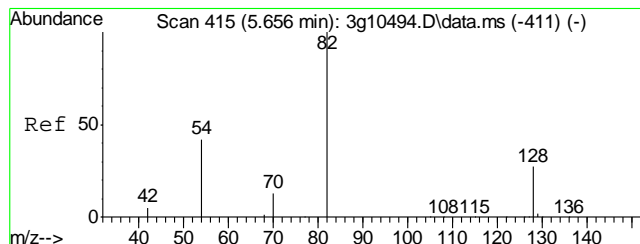
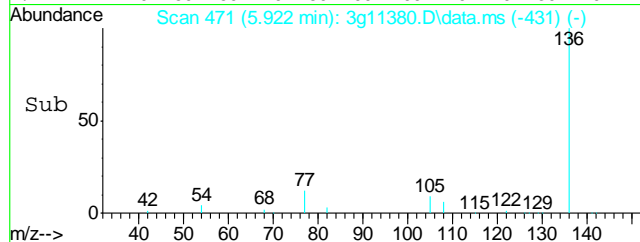
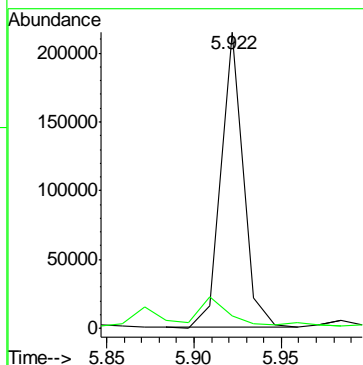
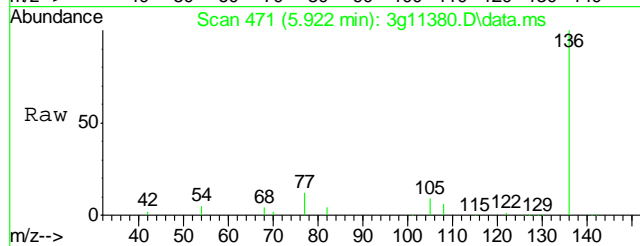
Quant Time: Sep 25 10:29:41 2012  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G511.M  
Quant Title : PAHSIM BASE  
QLast Update : Thu Sep 06 09:42:23 2012  
Response via : Initial Calibration





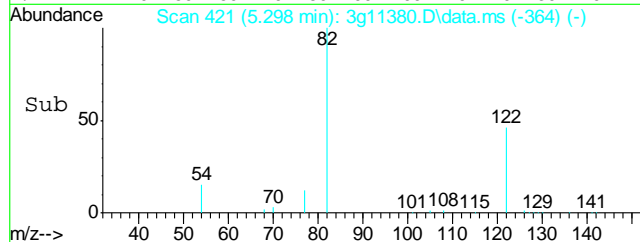
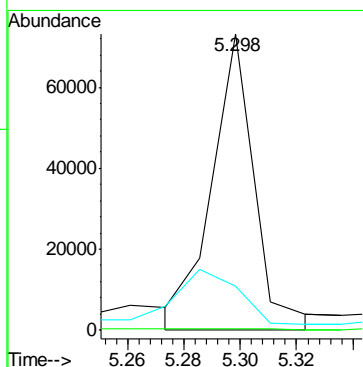
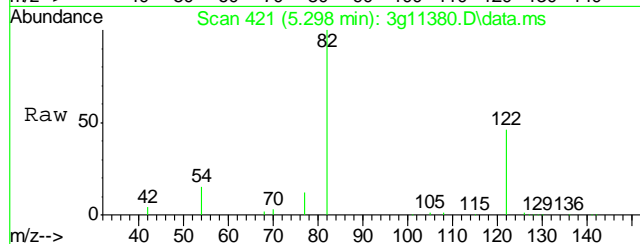
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.922 min Scan# 471  
Delta R.T. -0.000 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

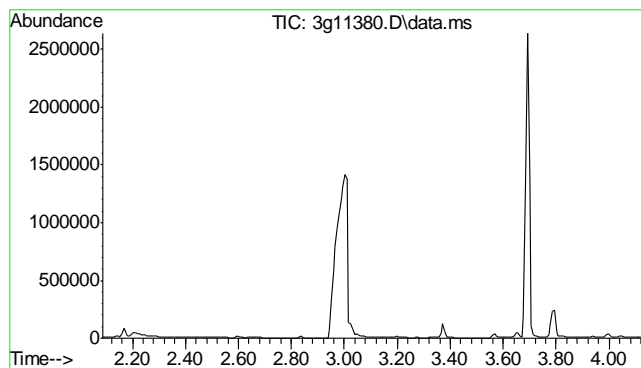
Tgt Ion: 136 Resp: 190124  
Ion Ratio Lower Upper  
136 100  
68 10.5 0.0 30.4



#2  
Nitrobenzene-d5  
Concen: 4.0634 ug/mL m  
RT: 5.298 min Scan# 421  
Delta R.T. 0.075 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion: 82 Resp: 76010  
Ion Ratio Lower Upper  
82 100  
128 0.0 19.7 59.7#  
54 5075.2 28.6 68.6#

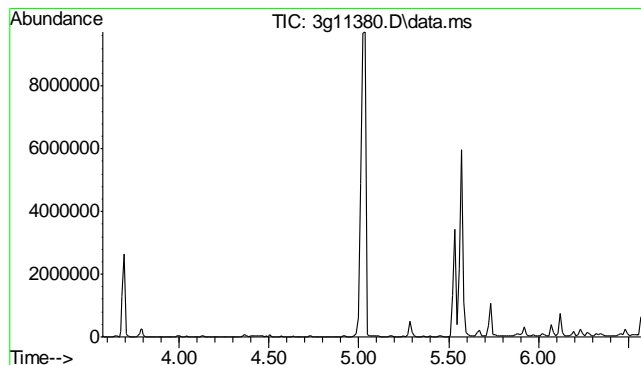
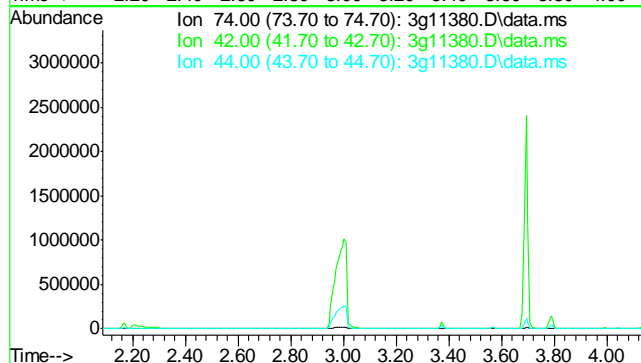




#3  
N-Nitrosodimethylamine  
Concen: N.D. ug/mL  
Expected RT: 2.62 min

Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

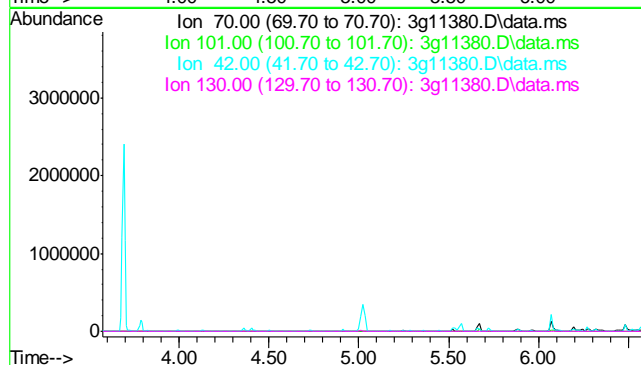
Tgt Ion:	74
Sig	Exp Ratio
74	100
42	53.3
44	3.5

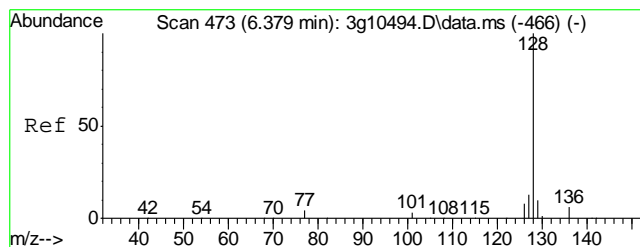


#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 5.07 min

Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion:	70
Sig	Exp Ratio
70	100
101	10.3
42	47.6
130	20.0





#5

Naphthalene

Concen: 0.3225 ug/mL

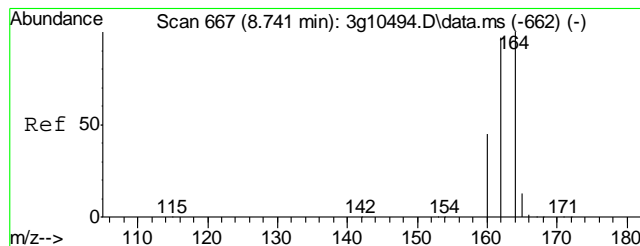
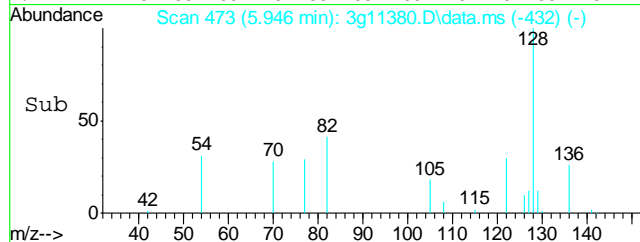
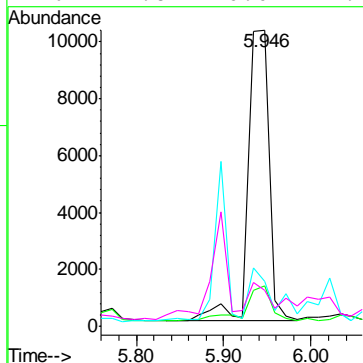
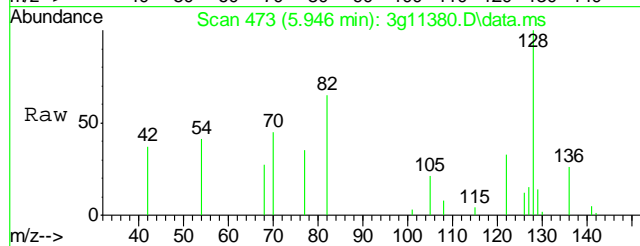
RT: 5.946 min Scan# 473

Delta R.T. 0.012 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

Tgt Ion:128	Resp:	17065
Ion Ratio	Lower	Upper
128	100	
129	15.4	0.0 30.8
127	19.4	0.0 33.4
126	11.8	0.0 27.7



#6

Acenaphthene-d10

Concen: 4.0000 ug/mL

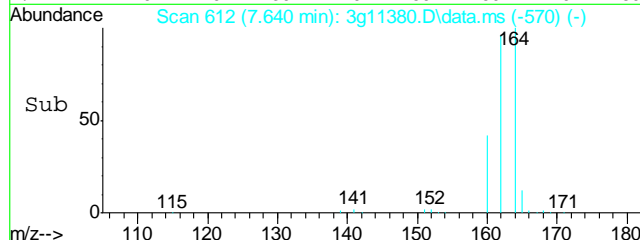
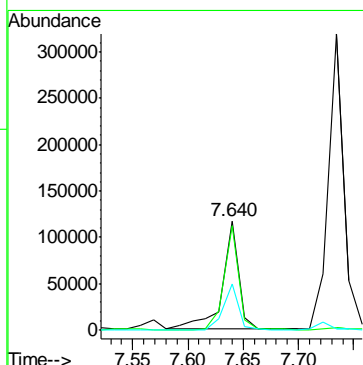
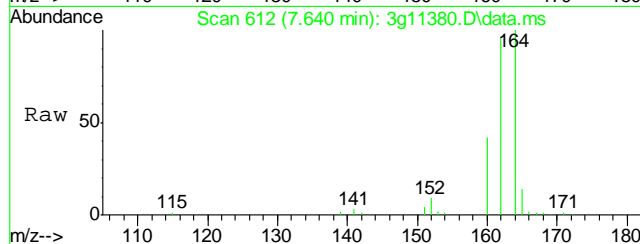
RT: 7.640 min Scan# 612

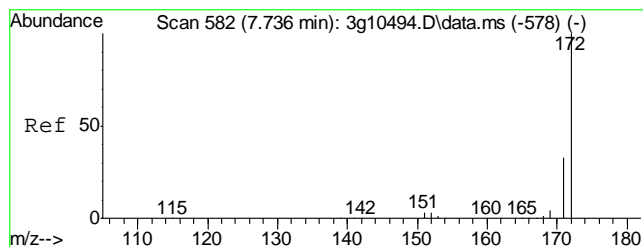
Delta R.T. -0.000 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

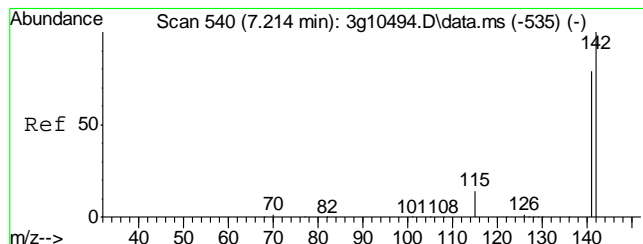
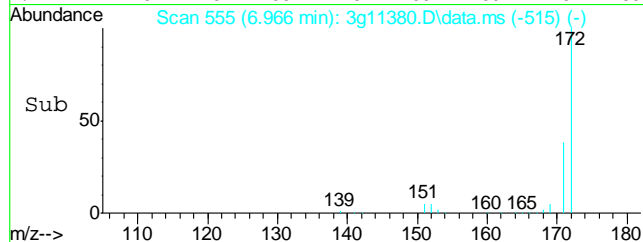
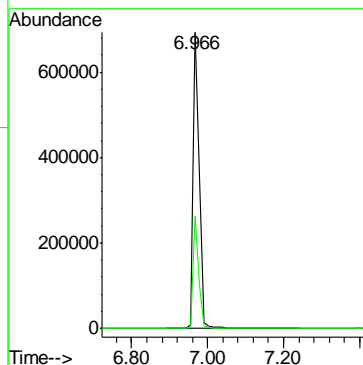
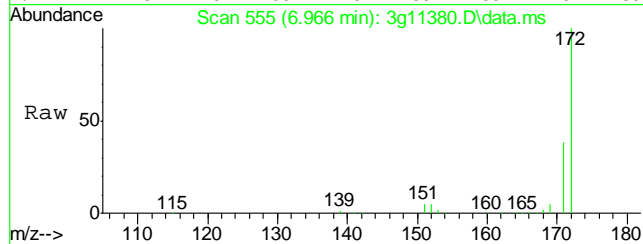
Tgt Ion:164	Resp:	123085
Ion Ratio	Lower	Upper
164	100	
162	83.7	73.5 113.5
160	38.4	21.8 61.8





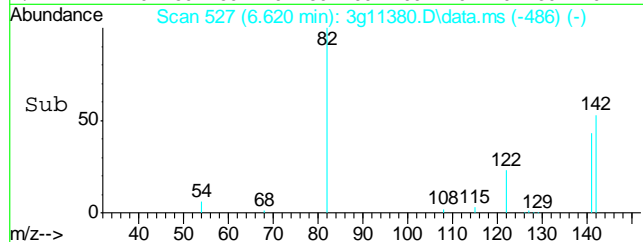
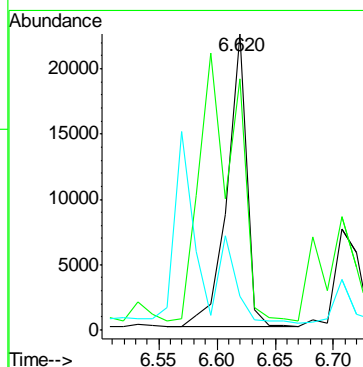
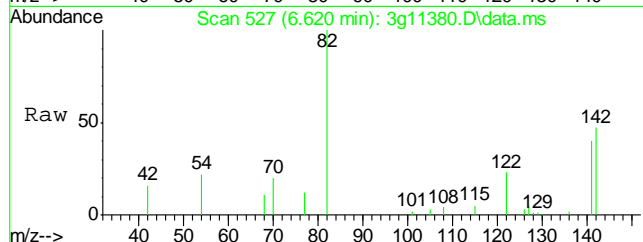
#7  
2-Fluorobiphenyl  
Concen: 15.1153 ug/mL  
RT: 6.966 min Scan# 555  
Delta R.T. -0.000 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

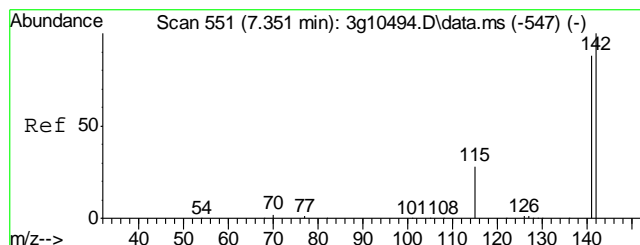
Tgt Ion: 172 Resp: 773908  
Ion Ratio Lower Upper  
172 100  
171 34.8 13.6 53.6



#8  
2-Methylnaphthalene  
Concen: 0.7252 ug/mL  
RT: 6.620 min Scan# 527  
Delta R.T. 0.012 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion: 142 Resp: 26388  
Ion Ratio Lower Upper  
142 100  
141 168.1 64.5 104.5#  
115 58.4 13.6 53.6#





#9

1-Methylnaphthalene

Concen: 0.2825 ug/mL

RT: 6.707 min Scan# 534

Delta R.T. -0.000 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

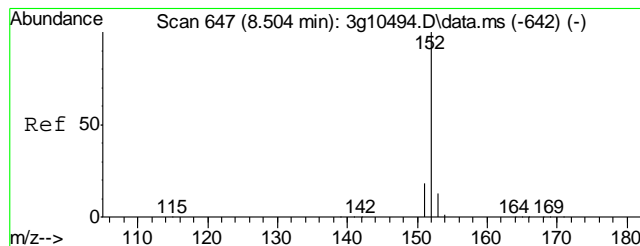
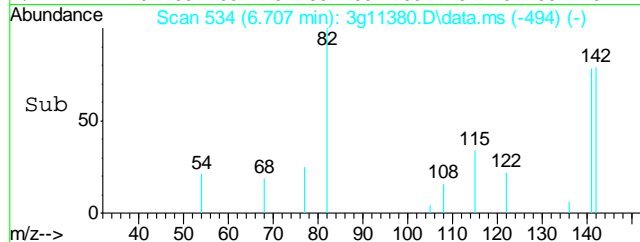
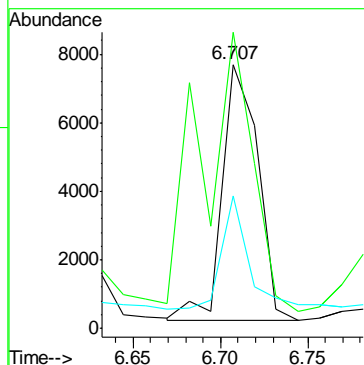
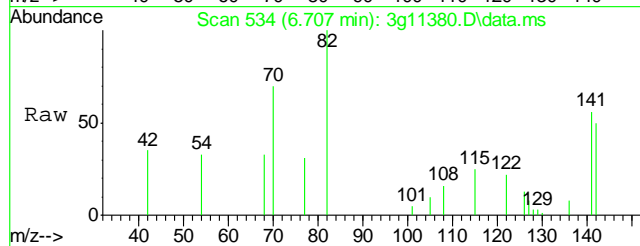
Tgt Ion:142 Resp: 10640

Ion Ratio Lower Upper

142 100

141 157.6 67.8 107.8#

115 35.3 11.0 51.0



#10

Acenaphthylene

Concen: 0.5154 ug/mL

RT: 7.439 min Scan# 595

Delta R.T. -0.059 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

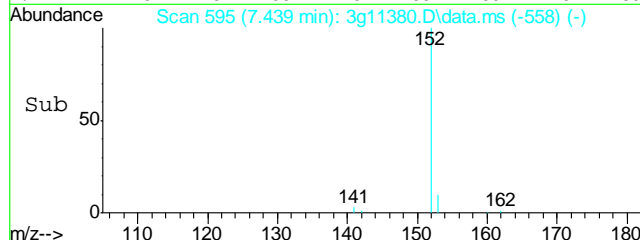
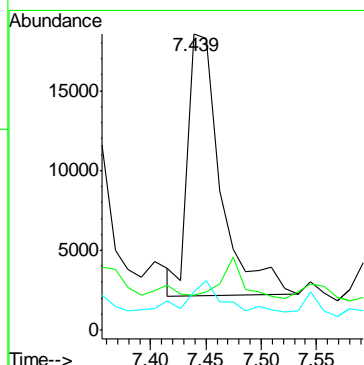
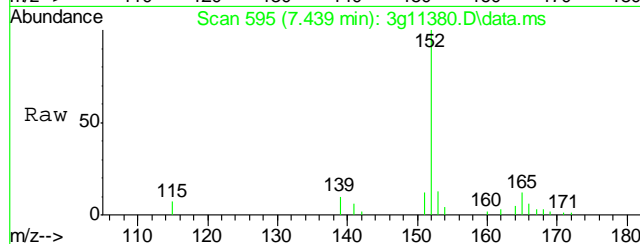
Tgt Ion:152 Resp: 34068

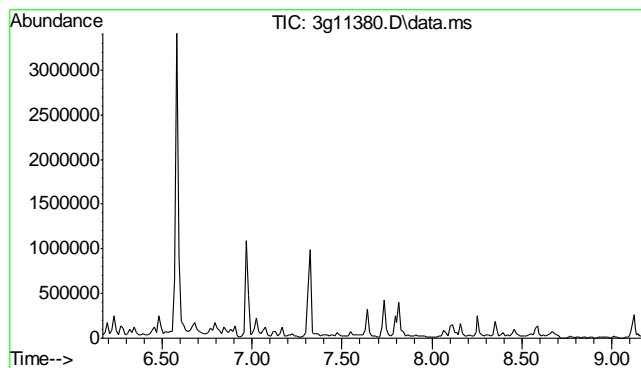
Ion Ratio Lower Upper

152 100

151 10.9 0.0 39.2

153 16.9 0.0 33.2

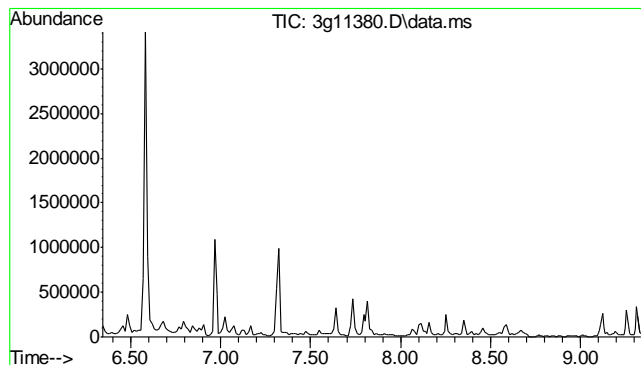
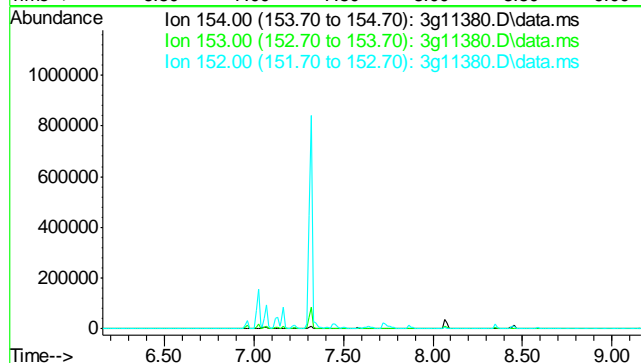




#11  
Acenaphthene  
Concen: N.D. ug/mL  
Expected RT: 7.66 min

Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

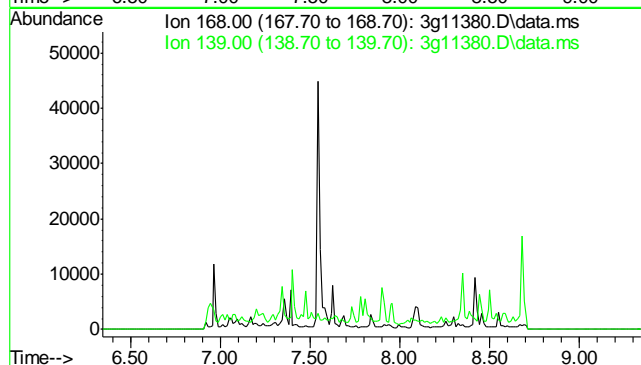
Tgt Ion:	154
Sig	Exp Ratio
154	100
153	104.8
152	49.9



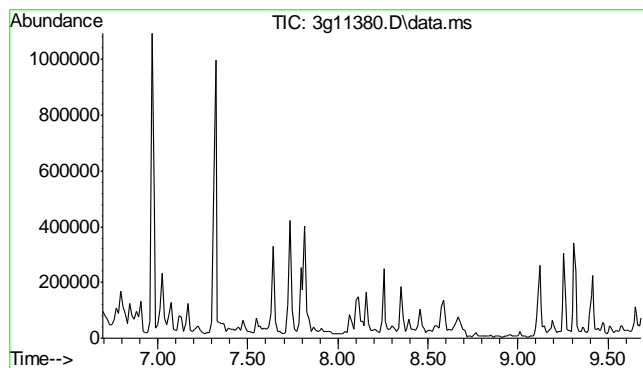
#12  
Dibenzofuran  
Concen: N.D. ug/mL  
Expected RT: 7.84 min

Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion:	168
Sig	Exp Ratio
168	100
139	27.6



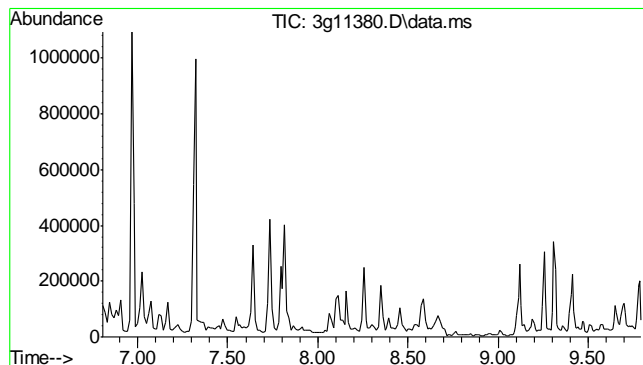
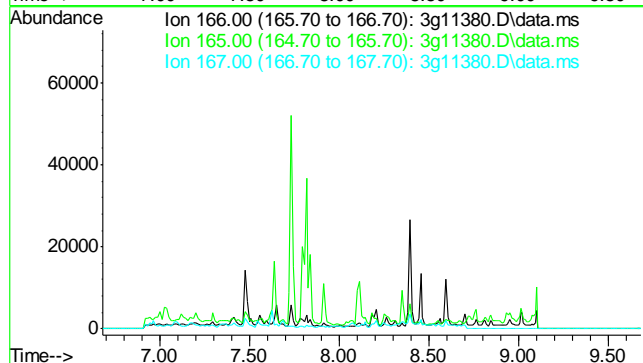




#13  
Fluorene  
Concen: N.D. ug/mL  
Expected RT: 8.18 min

Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

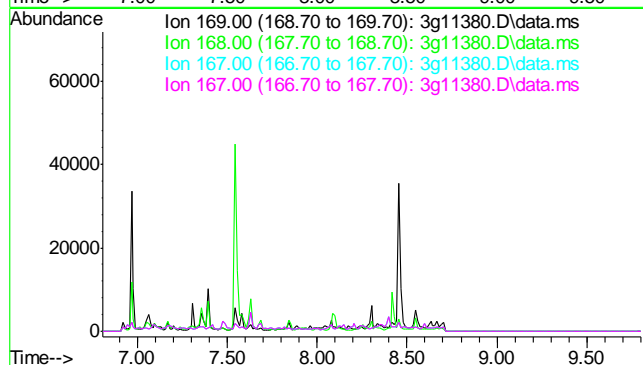
Tgt Ion:	166
Sig	Exp Ratio
166	100
165	91.1
167	13.3

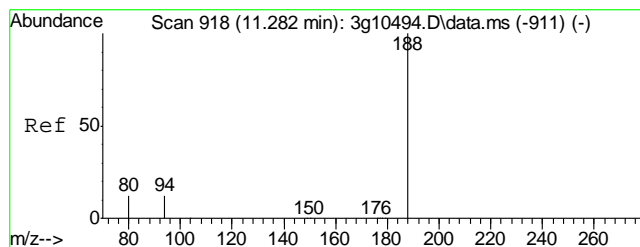


#14  
Diphenylamine  
Concen: N.D. ug/mL  
Expected RT: 8.30 min

Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion:	169
Sig	Exp Ratio
169	100
168	61.0
167	32.9
167	32.9





#15

Phenanthrene-d10

Concen: 4.0000 ug/mL

RT: 9.121 min Scan# 764

Delta R.T. -0.000 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

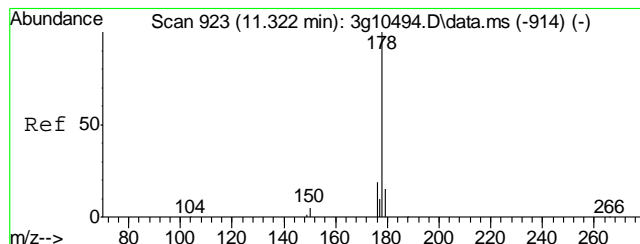
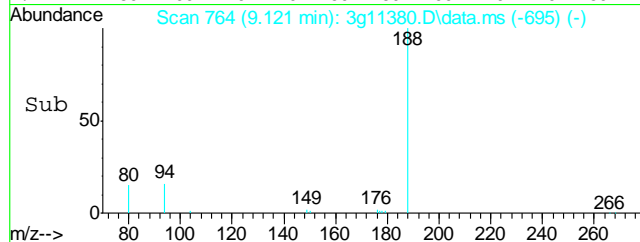
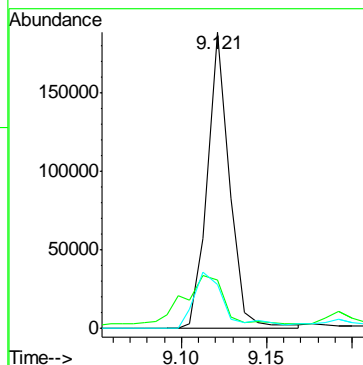
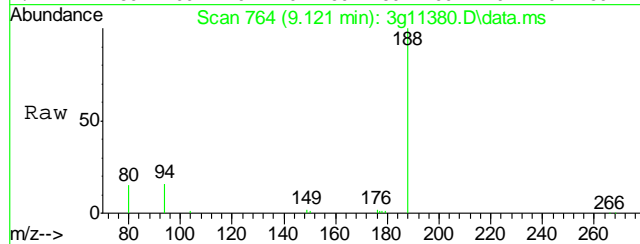
Tgt Ion:188 Resp: 161545

Ion Ratio Lower Upper

188 100

94 33.2 0.0 33.9

80 27.5 0.0 35.5



#16

Phenanthrene

Concen: 0.2360 ug/mL

RT: 9.145 min Scan# 767

Delta R.T. 0.008 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

Tgt Ion:178 Resp: 13374

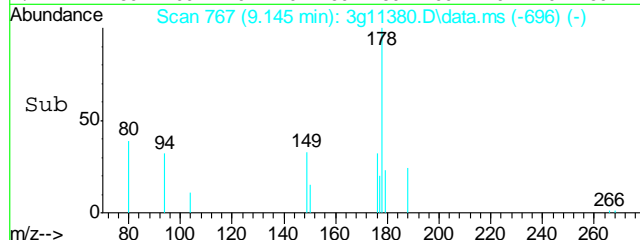
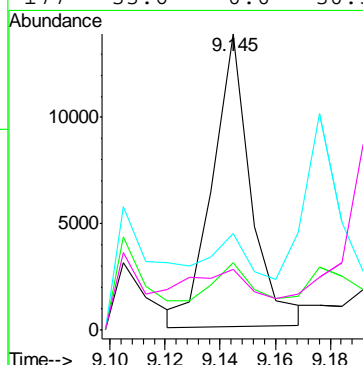
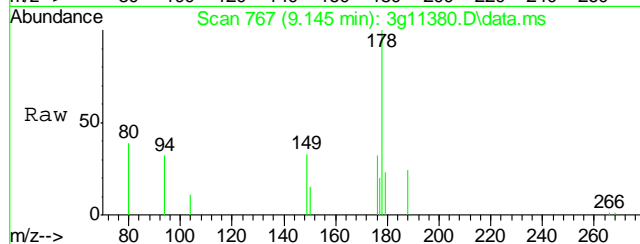
Ion Ratio Lower Upper

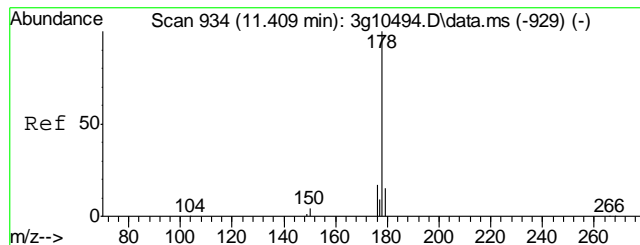
178 100

179 0.0 0.0 35.3

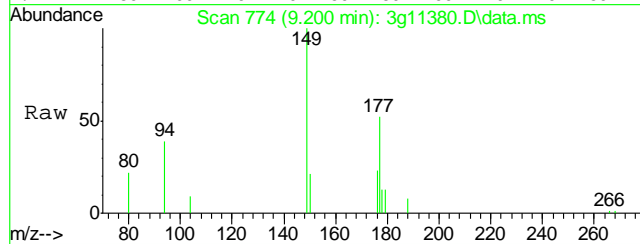
176 0.0 0.0 38.5

177 33.6 0.0 30.5#

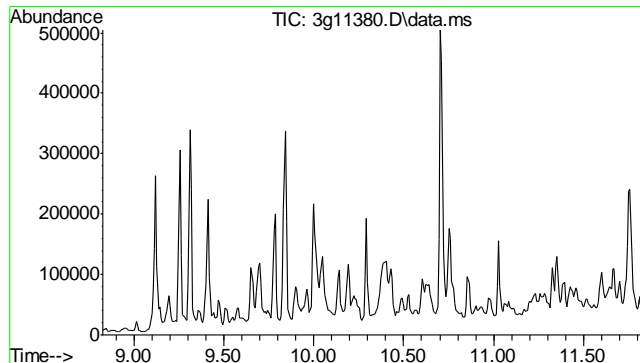
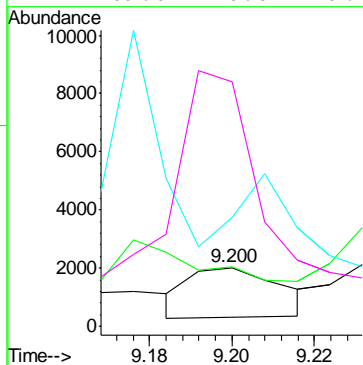
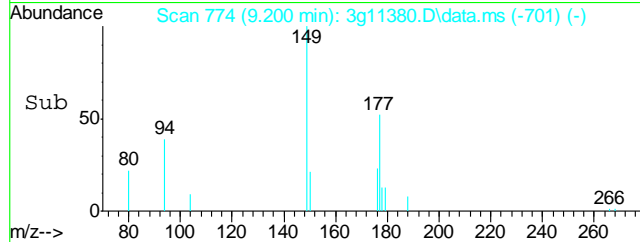




#17  
 Anthracene  
 Concen: Below ug/mL  
 RT: 9.200 min Scan# 774  
 Delta R.T. 0.008 min  
 Lab File: 3g11380.D  
 Acq: 24 Sep 12 10:25 pm

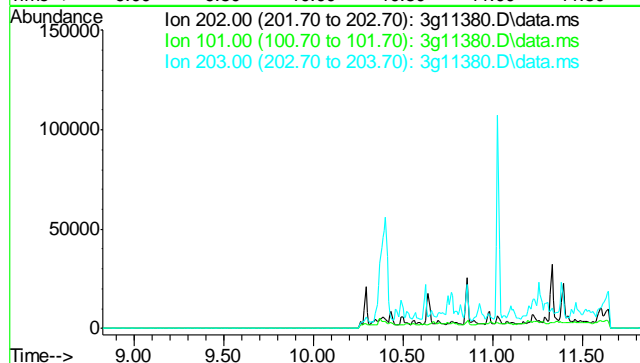


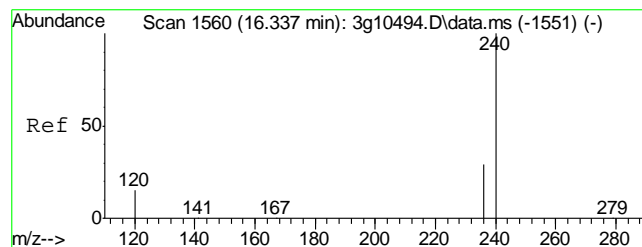
Tgt Ion:	178	Resp:	2621
Ion Ratio	Lower	Upper	
178	100		
179	114.9	0.0	35.2#
176	0.0	0.0	37.7
177	409.0	0.0	29.0#



#18  
 Fluoranthene  
 Concen: N.D. ug/mL  
 Expected RT: 10.32 min  
 Lab File: 3g11380.D  
 Acq: 24 Sep 12 10:25 pm

Tgt Ion:	202
Sig	Exp Ratio
202	100
101	13.0
203	17.4





#19

Chrysene-d12

Concen: 4.0000 ug/mL

RT: 11.759 min Scan# 1100

Delta R.T. 0.006 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

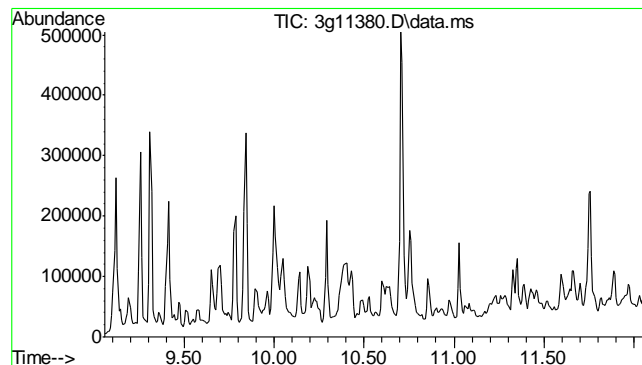
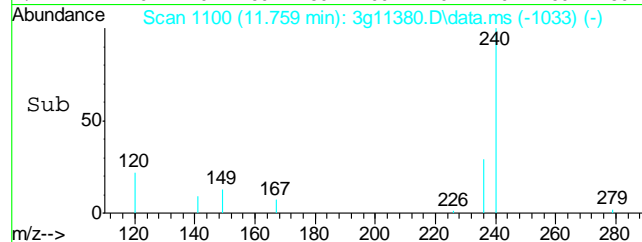
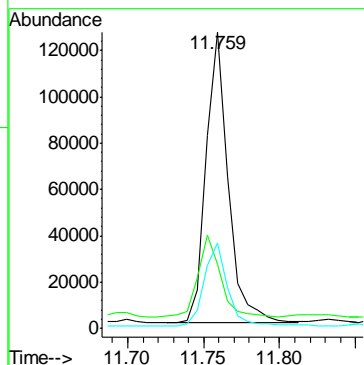
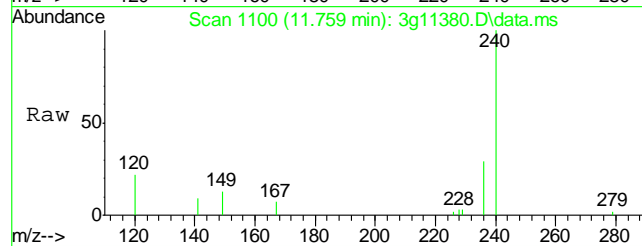
Tgt Ion: 240 Resp: 127772

Ion Ratio Lower Upper

240 100

120 32.6 0.0 36.2

236 31.9 8.8 48.8



#20

Pyrene

Concen: N.D. ug/mL

Expected RT: 10.55 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

Tgt Ion: 202

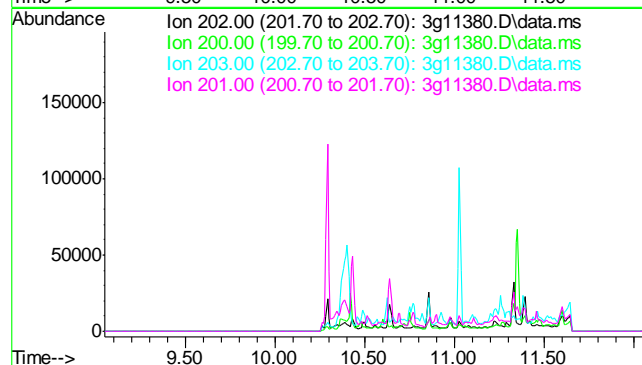
Sig Exp Ratio

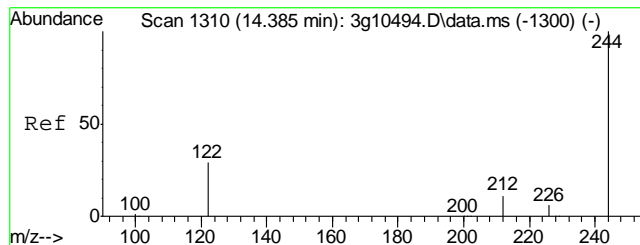
202 100

200 20.1

203 17.8

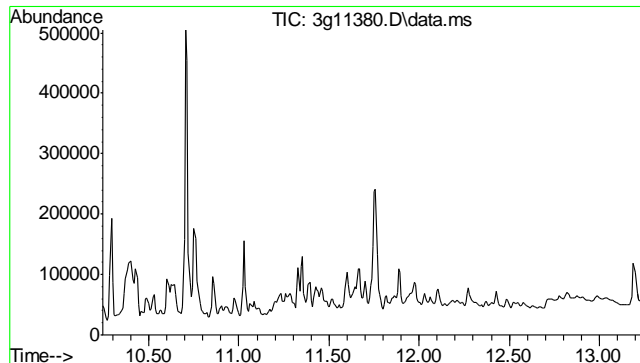
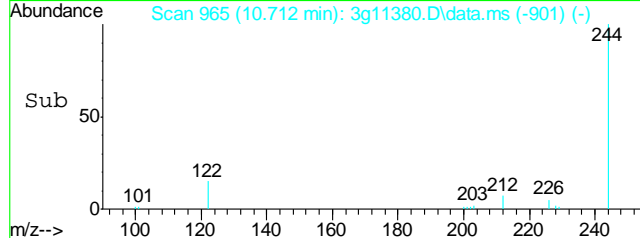
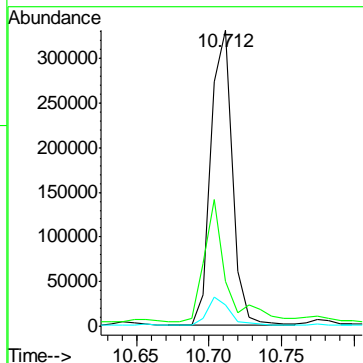
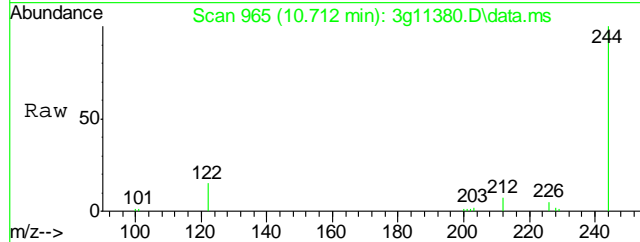
201 16.6





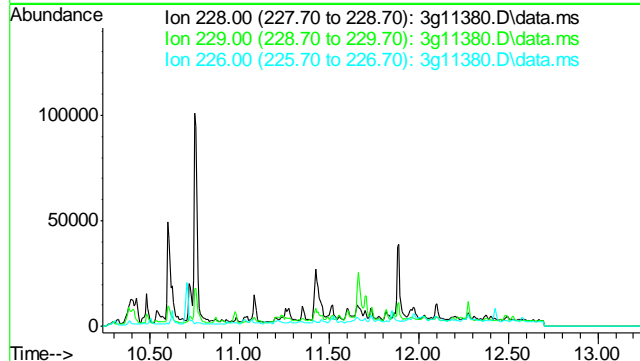
#21  
Terphenyl-d14  
Concen: 17.7324 ug/mL m  
RT: 10.712 min Scan# 965  
Delta R.T. 0.008 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

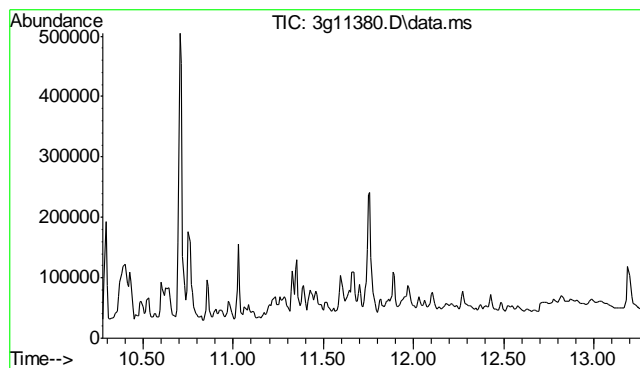
Tgt Ion	Ratio	Lower	Upper
244	100		
122	1.7	1.3	41.3
212	0.5	0.0	28.8



#22  
Benzo(a)anthracene  
Concen: N.D. ug/mL  
Expected RT: 11.74 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion	Exp Ratio
228	100
229	19.6
226	26.6





#23

Chrysene

Concen: N.D. ug/mL

Expected RT: 11.77 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

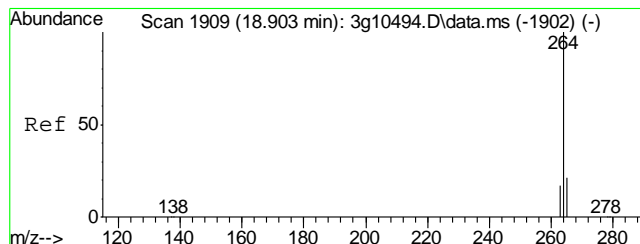
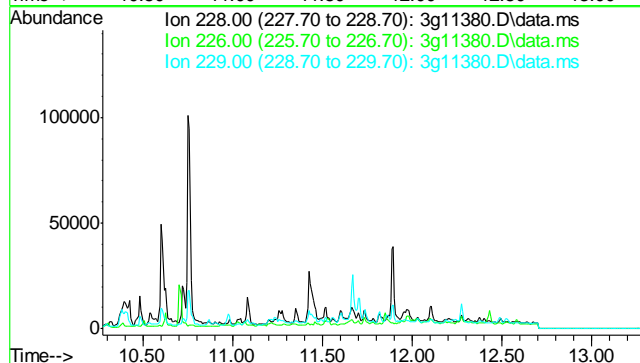
Tgt Ion: 228

Sig Exp Ratio

228 100

226 28.6

229 19.4



#24

Perylene-d12

Concen: 4.0000 ug/mL

RT: 13.188 min Scan# 1289

Delta R.T. 0.010 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

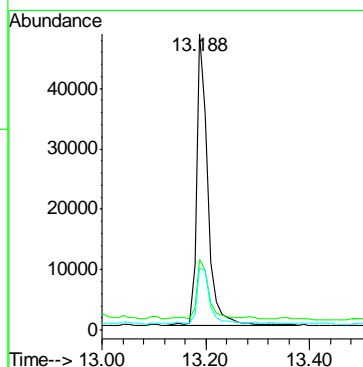
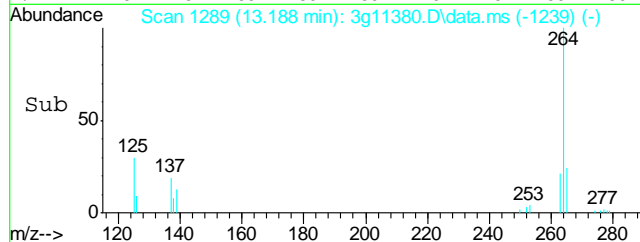
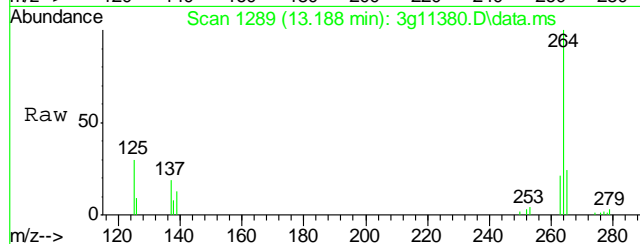
Tgt Ion: 264 Resp: 72844

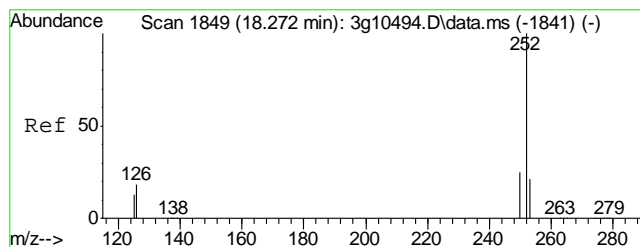
Ion Ratio Lower Upper

264 100

265 20.5 1.0 41.0

263 20.3 0.0 39.0





#25

Benzo(b)fluoranthene

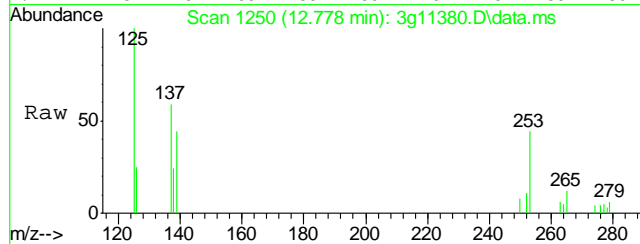
Concen: Below ug/mL

RT: 12.778 min Scan# 1250

Delta R.T. 0.000 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm



Tgt Ion: 252 Resp: 2014

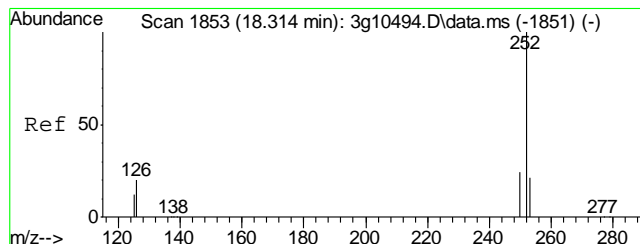
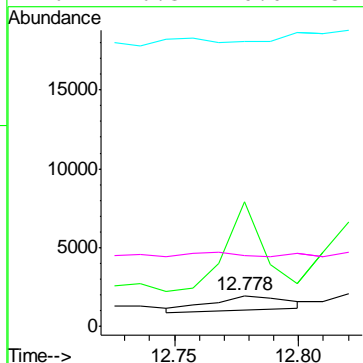
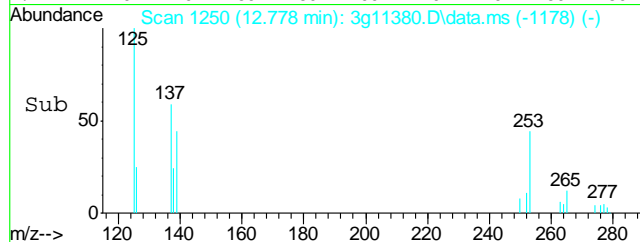
Ion Ratio Lower Upper

252 100

253 588.0 2.9 42.9#

125 0.0 0.0 31.5

126 1176.3 0.0 34.7#



#26

Benzo(k)fluoranthene

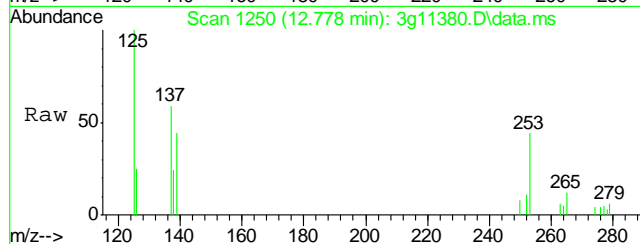
Concen: Below ug/mL

RT: 12.778 min Scan# 1250

Delta R.T. -0.021 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm



Tgt Ion: 252 Resp: 2014

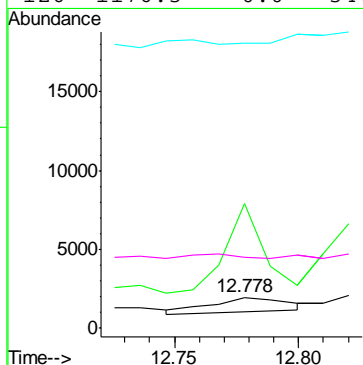
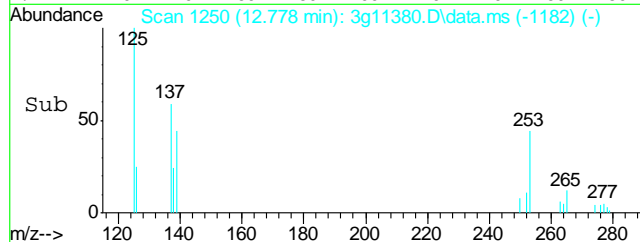
Ion Ratio Lower Upper

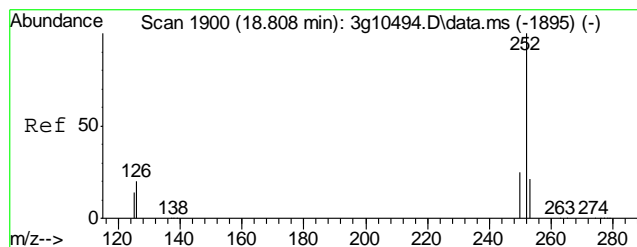
252 100

253 588.0 1.8 41.8#

125 0.0 0.0 31.0

126 1176.3 0.0 34.0#





#27

Benzo(a)pyrene

Concen: Below ug/mL

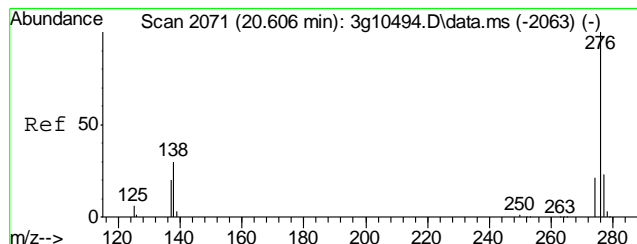
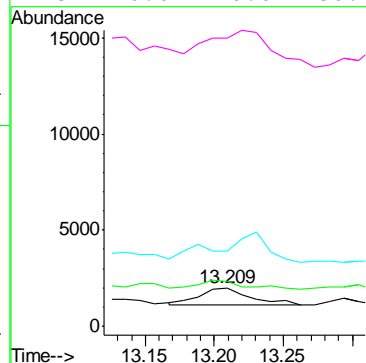
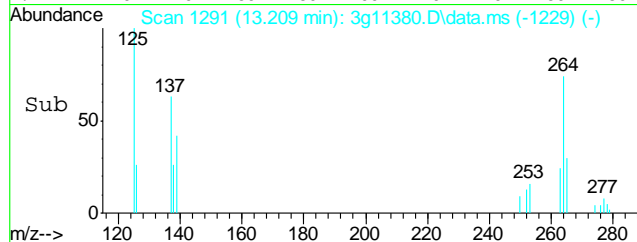
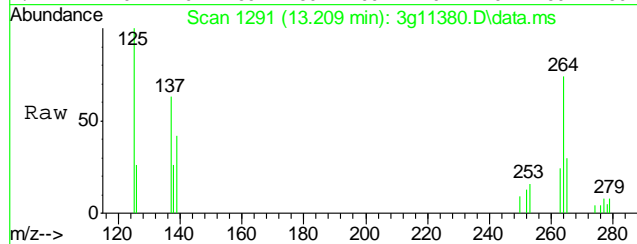
RT: 13.209 min Scan# 1291

Delta R.T. 0.095 min

Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

Tgt Ion:	252	Resp:	2362
Ion Ratio	Lower	Upper	
252	100		
253	0.0	1.4	41.4#
126	0.0	0.0	33.6
125	0.0	0.0	30.7



#28

Indeno(1,2,3-cd)pyrene

Concen: Below ug/mL

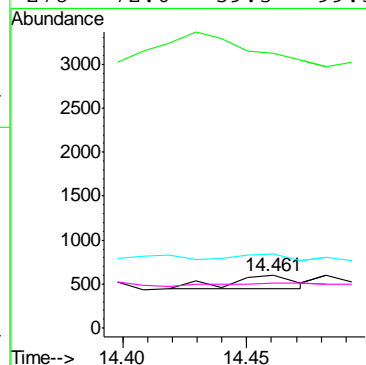
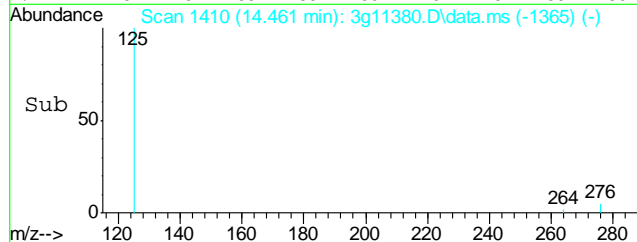
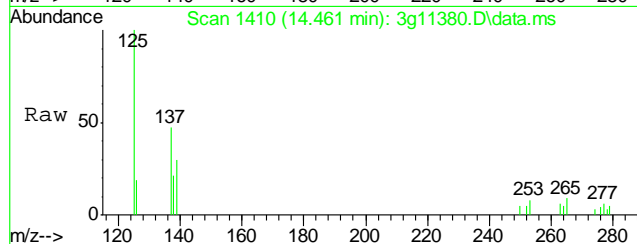
RT: 14.461 min Scan# 1410

Delta R.T. -0.031 min

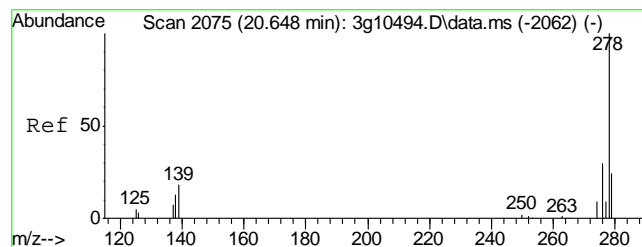
Lab File: 3g11380.D

Acq: 24 Sep 12 10:25 pm

Tgt Ion:	276	Resp:	292
Ion Ratio	Lower	Upper	
276	100		
138	1609.2	5.3	45.3#
277	121.9	5.0	45.0#
278	72.6	59.3	99.3

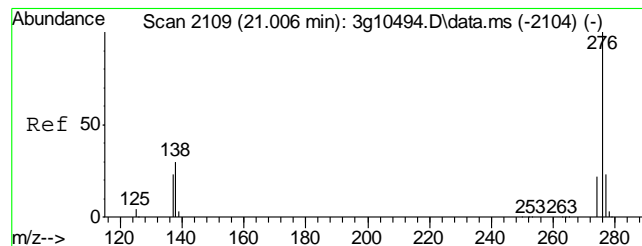
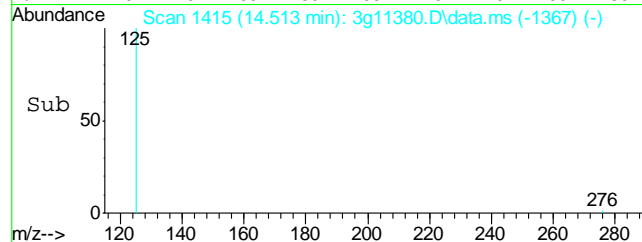
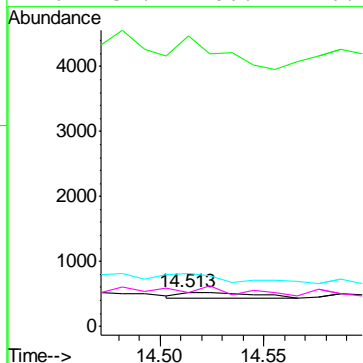
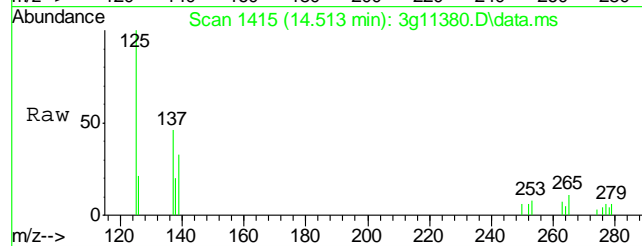






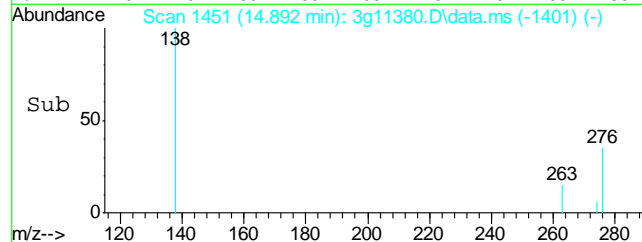
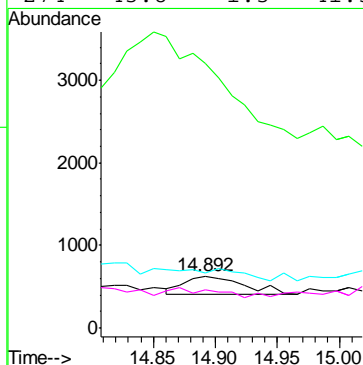
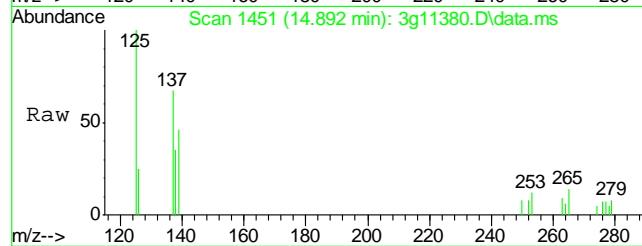
#29  
Dibenz(a,h)anthracene  
Concen: Below ug/mL  
RT: 14.513 min Scan# 1415  
Delta R.T. 0.000 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion: 278 Resp: 212  
Ion Ratio Lower Upper  
278 100  
139 0.0 0.0 38.4  
279 0.0 3.1 43.1#  
276 137.7 106.1 146.1



#30  
Benzo(g,h,i)perylene  
Concen: Below ug/mL  
RT: 14.892 min Scan# 1451  
Delta R.T. 0.021 min  
Lab File: 3g11380.D  
Acq: 24 Sep 12 10:25 pm

Tgt Ion: 276 Resp: 729  
Ion Ratio Lower Upper  
276 100  
138 1110.4 1.3 41.3#  
277 0.0 3.4 43.4#  
274 43.8 1.3 41.3#



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\092112\  
 Data File : 3g11337.D  
 Acq On : 21 Sep 2012 1:44 pm  
 Operator : DONC  
 Sample : OP6679-MB  
 Misc : OP6679,E3G529,30.00,,,1,1  
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Sep 24 10:36:09 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G511.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Thu Sep 06 09:42:23 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.922	136	190751	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.640	164	108766	4.0000	ug/mL	0.00
15) Phenanthrene-d10	9.129	188	171152	4.0000	ug/mL	0.00
19) Chrysene-d12	11.759	240	163898	4.0000	ug/mL	0.00
24) Perylene-d12	13.199	264	106480	4.0000	ug/mL	0.02

## System Monitoring Compounds

2) Nitrobenzene-d5	5.236	82	850564	45.3211	ug/mL	0.01
Spiked Amount 50.000	Range 25 - 135		Recovery =	90.64%		
7) 2-Fluorobiphenyl	6.978	172	2129853	47.0749	ug/mL	0.01
Spiked Amount 50.000	Range 25 - 135		Recovery =	94.14%		
21) Terphenyl-d14	10.712	244	1243282	50.3449	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	100.68%		

## Target Compounds

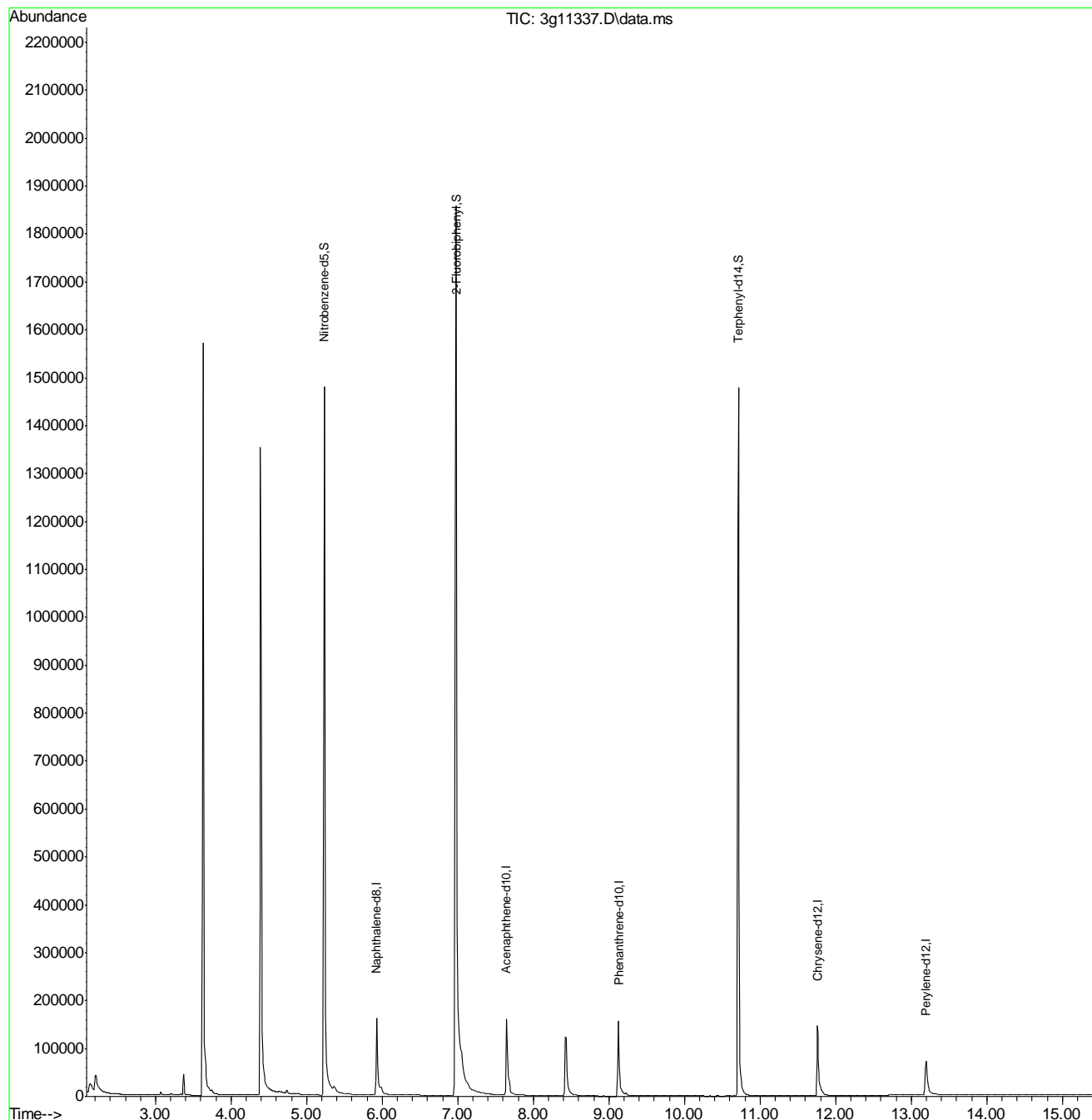
					Qvalue
3) N-Nitrosodimethylamine	0.000	74	0	N.D.	d
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d
5) Naphthalene	5.947	128	338	N.D.	
8) 2-Methylnaphthalene	6.620	142	236	N.D.	
9) 1-Methylnaphthalene	6.719	142	79	N.D.	
10) Acenaphthylene	0.000	152	0	N.D.	
11) Acenaphthene	7.640	154	494	N.D.	
12) Dibenzofuran	7.852	168	152	N.D.	
13) Fluorene	0.000	166	0	N.D.	d
14) Diphenylamine	0.000	169	0	N.D.	d
16) Phenanthrene	9.145	178	639	N.D.	
17) Anthracene	9.200	178	288	N.D.	
18) Fluoranthene	10.427	202	355	N.D.	
20) Pyrene	10.427	202	355	N.D.	
22) Benzo(a)anthracene	11.759	228	767	N.D.	
23) Chrysene	11.759	228	767	N.D.	
25) Benzo(b)fluoranthene	12.820	252	1932	N.D.	
26) Benzo(k)fluoranthene	12.820	252	1932	N.D.	
27) Benzo(a)pyrene	13.189	252	573	N.D.	
28) Indeno(1,2,3-cd)pyrene	14.514	276	61	N.D.	
29) Dibenz(a,h)anthracene	14.566	278	153	N.D.	
30) Benzo(g,h,i)perylene	14.903	276	88	N.D.	

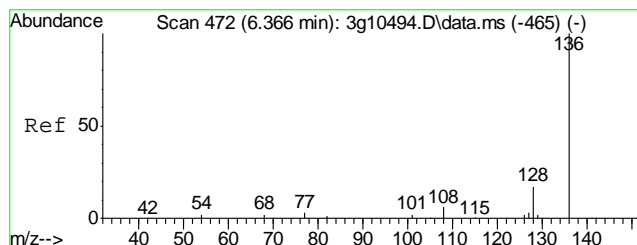
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\092112\  
Data File : 3g11337.D  
Acq On : 21 Sep 2012 1:44 pm  
Operator : DONC  
Sample : OP6679-MB  
Misc : OP6679,E3G529,30.00,,,1,1  
ALS Vial : 4 Sample Multiplier: 1

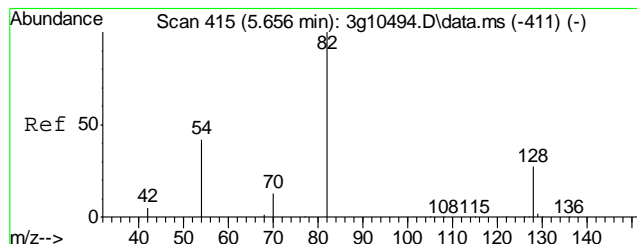
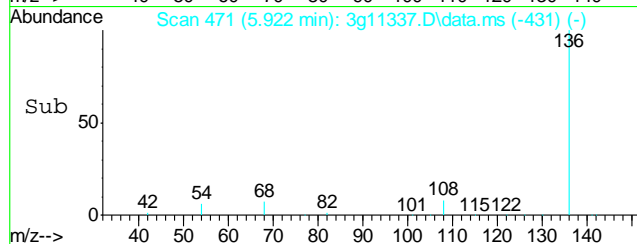
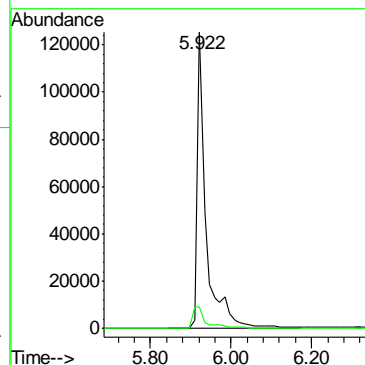
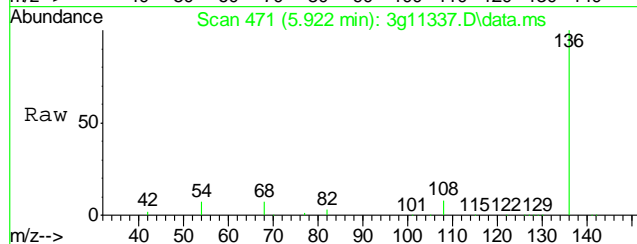
Quant Time: Sep 24 10:36:09 2012  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G511.M  
Quant Title : PAHSIM BASE  
QLast Update : Thu Sep 06 09:42:23 2012  
Response via : Initial Calibration





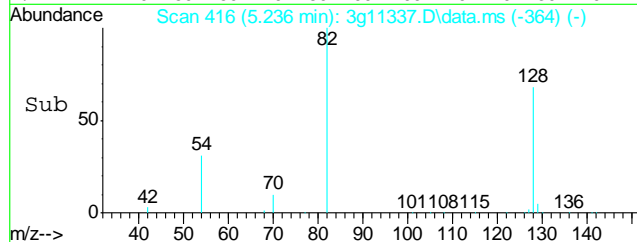
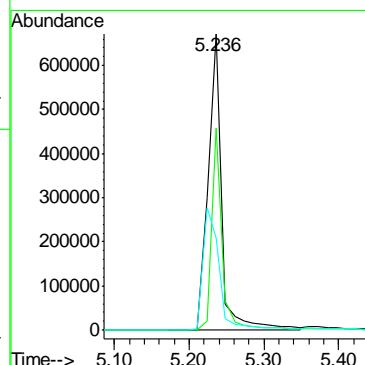
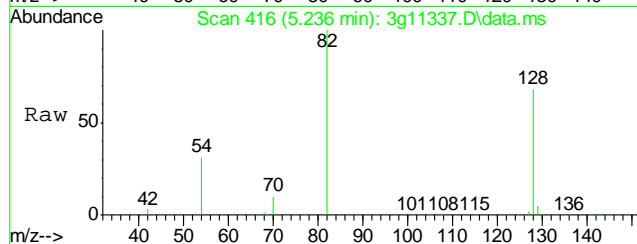
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.922 min Scan# 471  
Delta R.T. -0.000 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

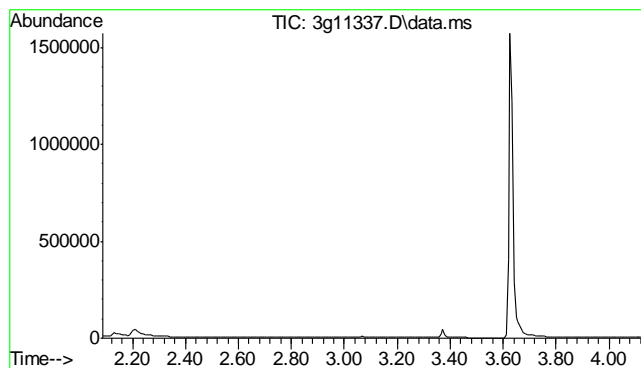
Tgt Ion: 136 Resp: 190751  
Ion Ratio Lower Upper  
136 100  
68 10.6 0.0 30.4



#2  
Nitrobenzene-d5  
Concen: 45.3211 ug/mL  
RT: 5.236 min Scan# 416  
Delta R.T. 0.013 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion: 82 Resp: 850564  
Ion Ratio Lower Upper  
82 100  
128 53.1 19.7 59.7  
54 49.1 28.6 68.6

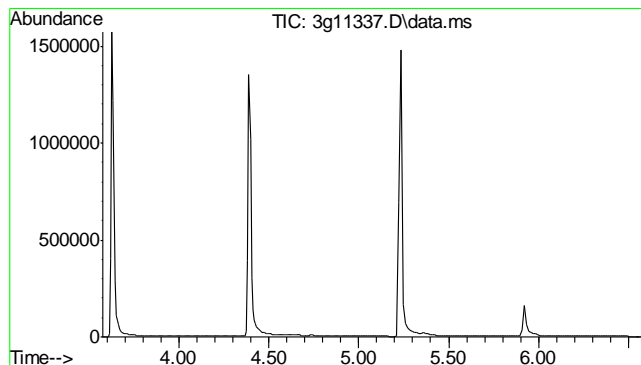
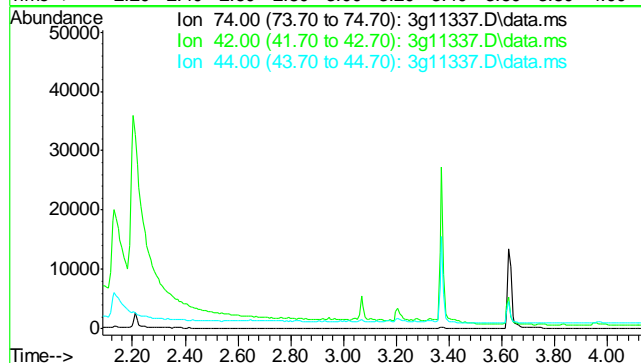




#3  
N-Nitrosodimethylamine  
Concen: N.D. ug/mL  
Expected RT: 2.62 min

Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

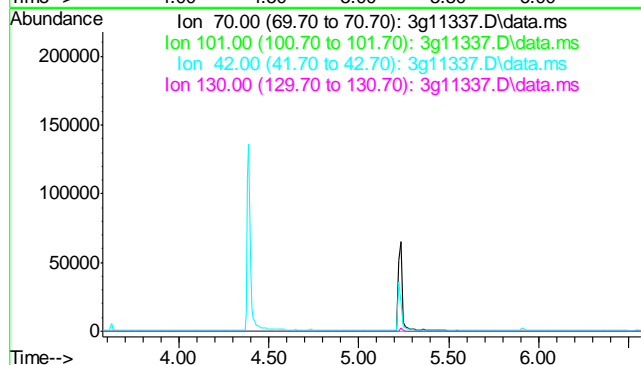
Tgt Ion:	74
Sig	Exp Ratio
74	100
42	53.3
44	3.5

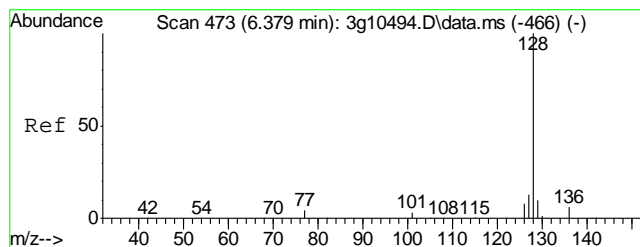


#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 5.07 min

Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

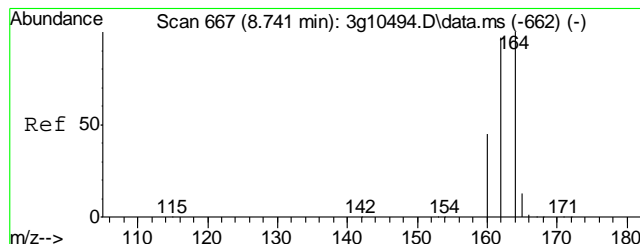
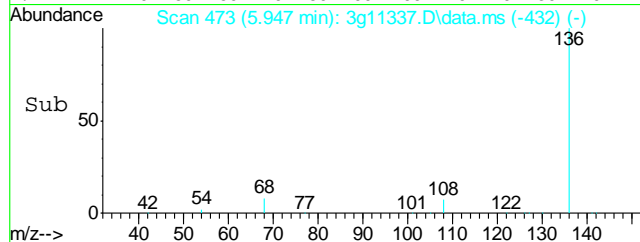
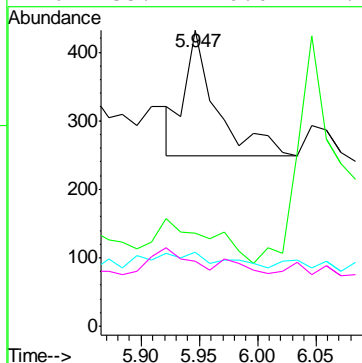
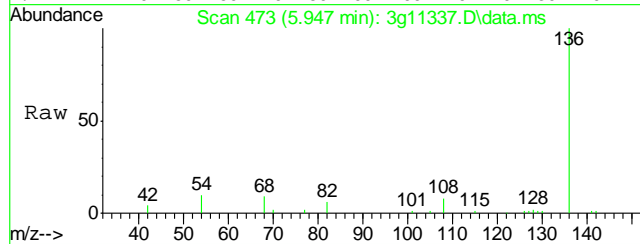
Tgt Ion:	70
Sig	Exp Ratio
70	100
101	10.3
42	47.6
130	20.0





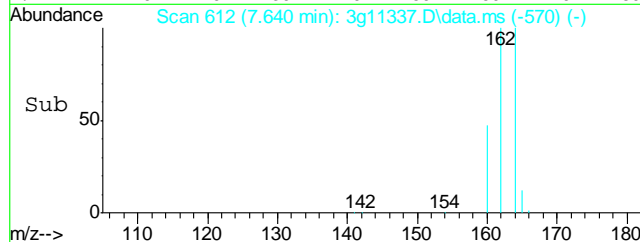
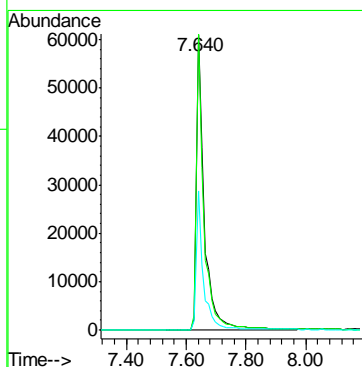
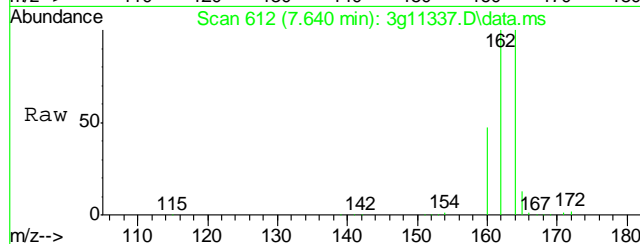
#5  
Naphthalene  
Concen: Below ug/mL  
RT: 5.947 min Scan# 473  
Delta R.T. 0.012 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

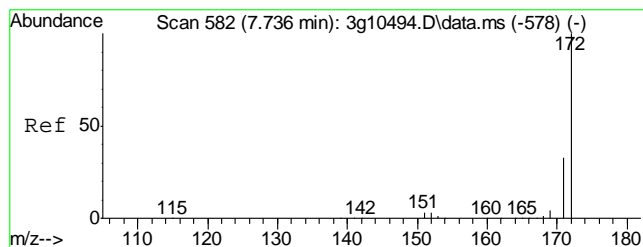
Tgt Ion:128 Resp: 338  
Ion Ratio Lower Upper  
128 100  
129 62.7 0.0 30.8#  
127 52.4 0.0 33.4#  
126 33.1 0.0 27.7#



#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.640 min Scan# 612  
Delta R.T. -0.000 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

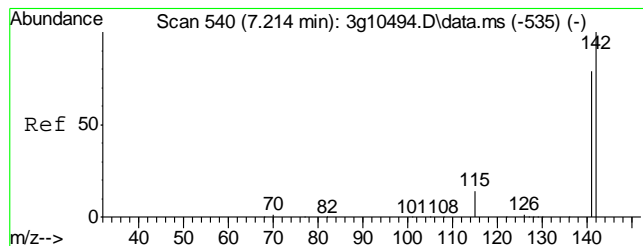
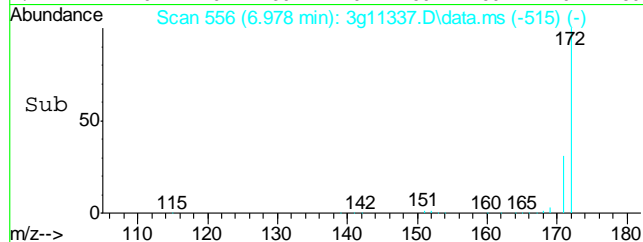
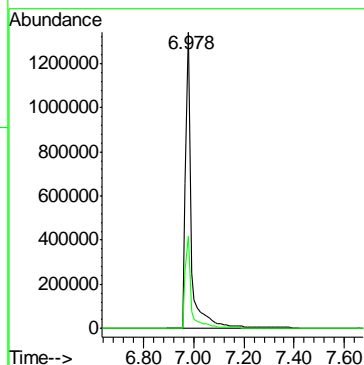
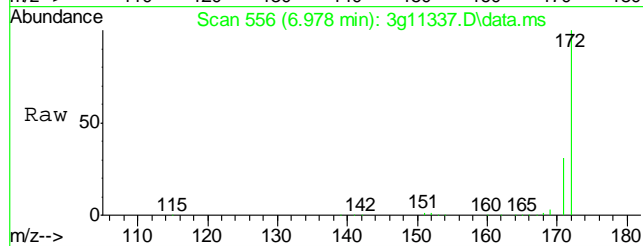
Tgt Ion:164 Resp: 108766  
Ion Ratio Lower Upper  
164 100  
162 95.6 73.5 113.5  
160 42.3 21.8 61.8





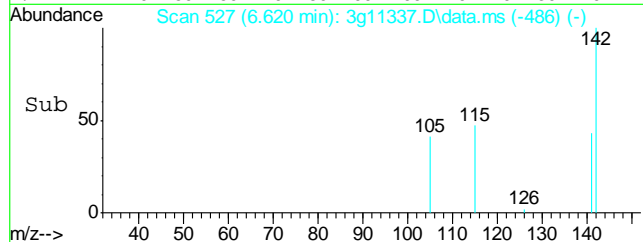
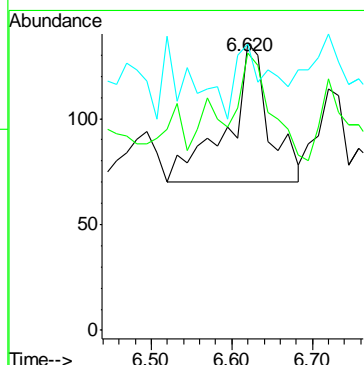
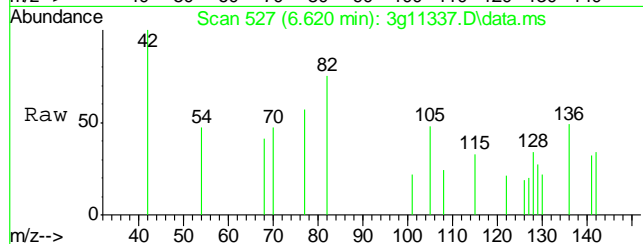
#7  
2-Fluorobiphenyl  
Concen: 47.0749 ug/mL  
RT: 6.978 min Scan# 556  
Delta R.T. 0.012 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

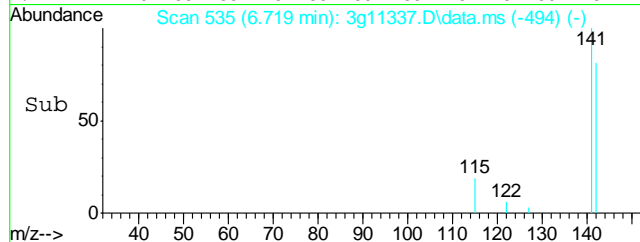
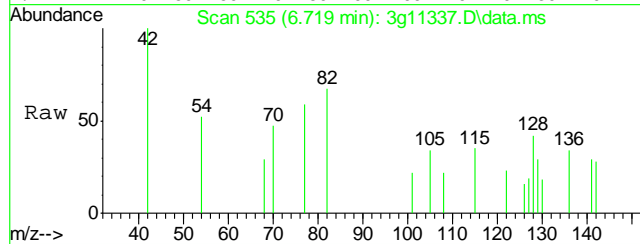
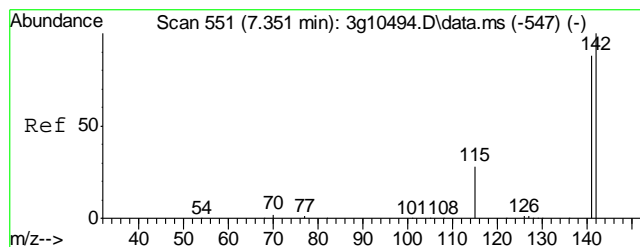
Tgt Ion:172 Resp: 2129853  
Ion Ratio Lower Upper  
172 100  
171 33.5 13.6 53.6



#8  
2-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.620 min Scan# 527  
Delta R.T. 0.012 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

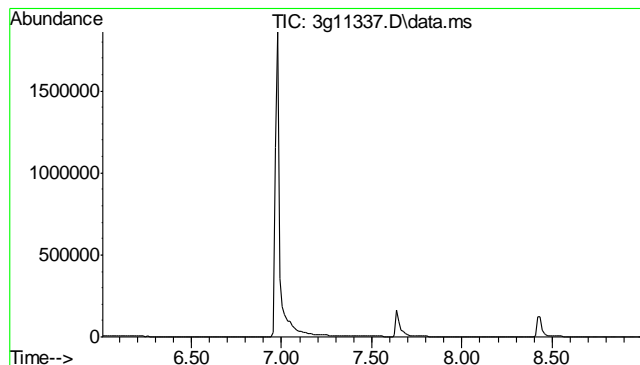
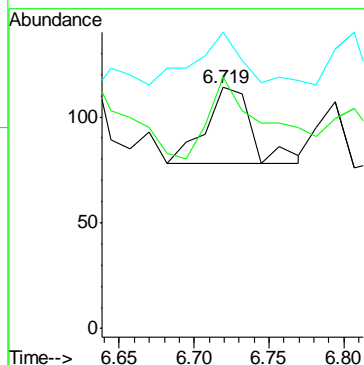
Tgt Ion:142 Resp: 236  
Ion Ratio Lower Upper  
142 100  
141 57.6 64.5 104.5#  
115 0.0 13.6 53.6#





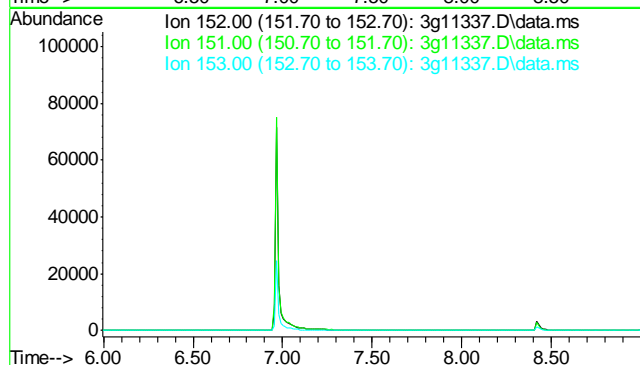
#9  
1-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.719 min Scan# 535  
Delta R.T. 0.012 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion: 142	Resp:	79
Ion Ratio	Lower	Upper
142	100	
141	130.4	67.8 107.8#
115	0.0	11.0 51.0#

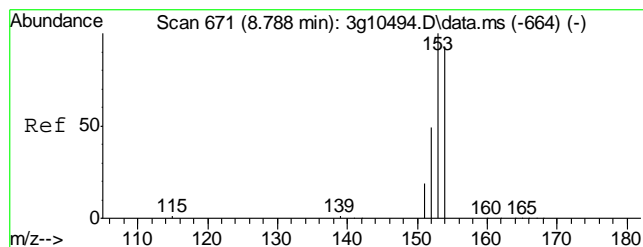


#10  
Acenaphthylene  
Concen: N.D. ug/mL  
Expected RT: 7.50 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion: 152	
Sig	Exp Ratio
152	100
151	19.2
153	13.2

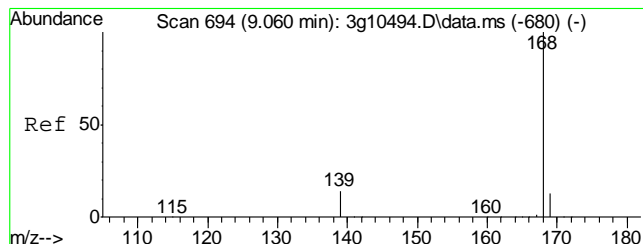
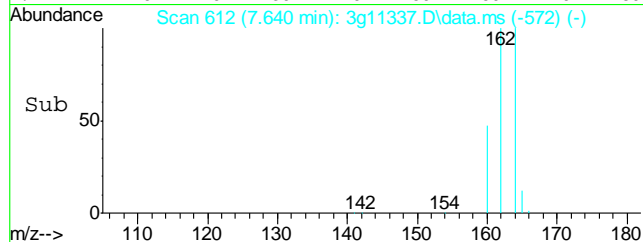
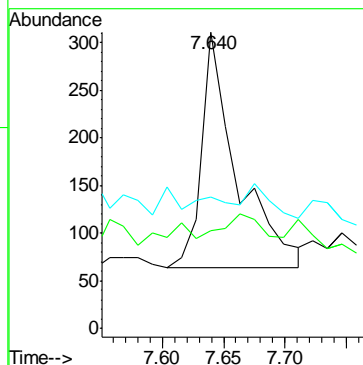
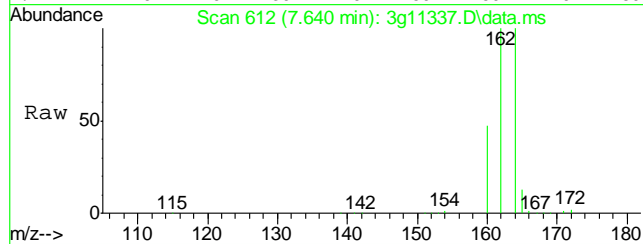






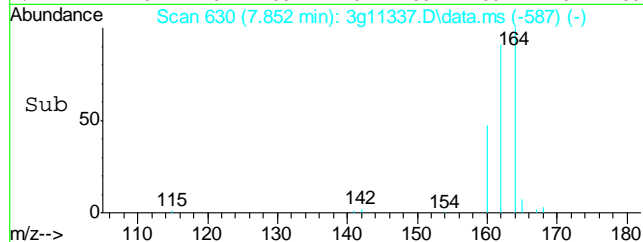
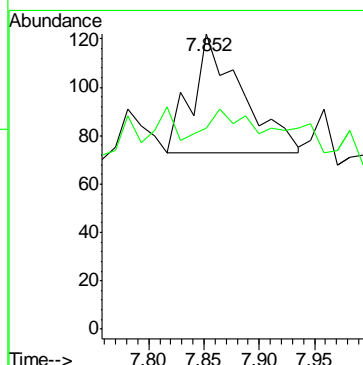
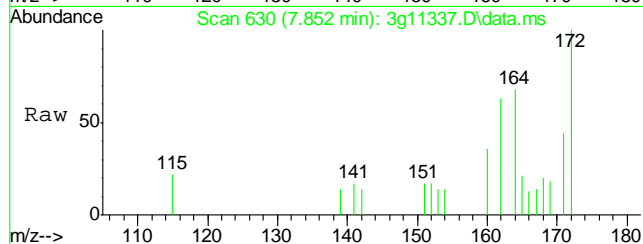
#11  
Acenaphthene  
Concen: Below ug/mL  
RT: 7.640 min Scan# 612  
Delta R.T. -0.024 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

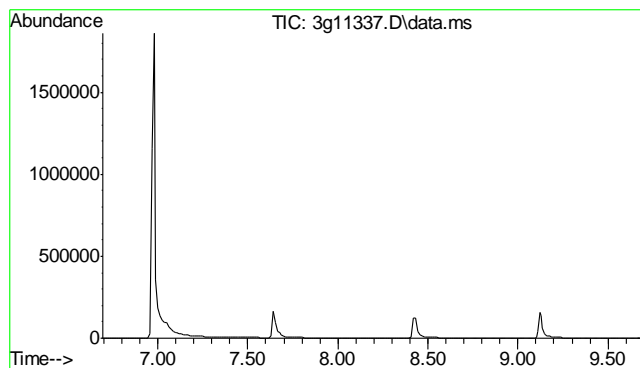
Tgt Ion:	154	Resp:	494
Ion Ratio	Lower	Upper	
154	100		
153	10.1	84.8	124.8#
152	7.7	29.9	69.9#



#12  
Dibenzofuran  
Concen: Below ug/mL  
RT: 7.852 min Scan# 630  
Delta R.T. 0.012 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion:	168	Resp:	152
Ion Ratio	Lower	Upper	
168	100		
139	11.8	7.6	47.6

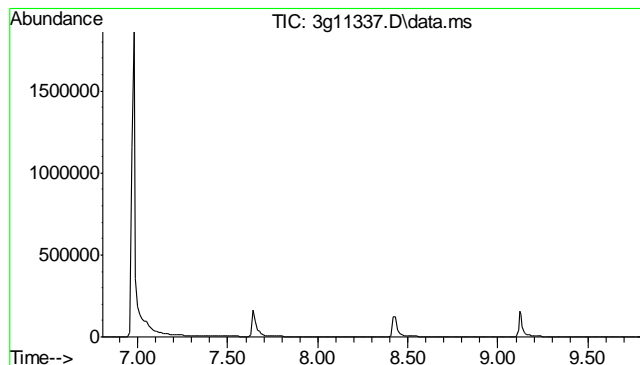
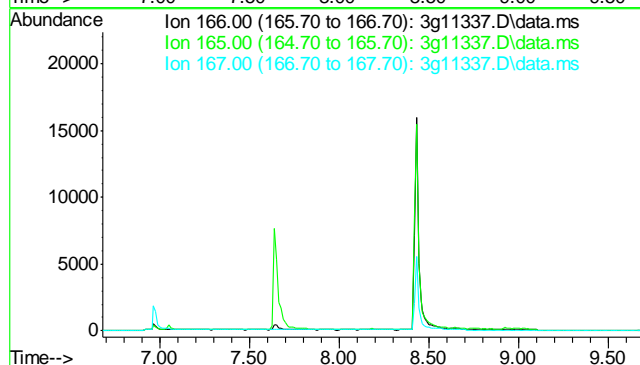




#13  
Fluorene  
Concen: N.D. ug/mL  
Expected RT: 8.18 min

Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

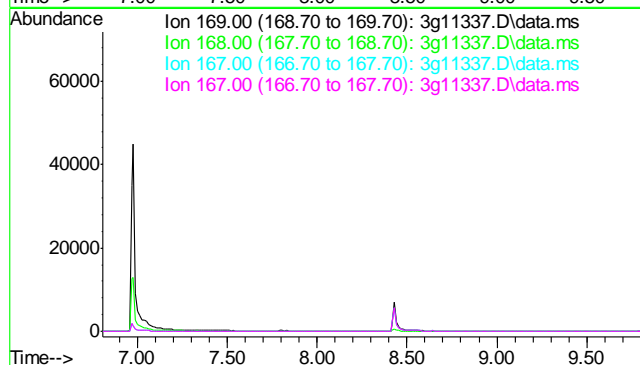
Tgt Ion:	166
Sig	Exp Ratio
166	100
165	91.1
167	13.3

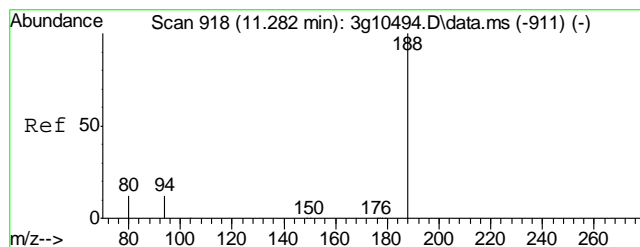


#14  
Diphenylamine  
Concen: N.D. ug/mL  
Expected RT: 8.30 min

Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

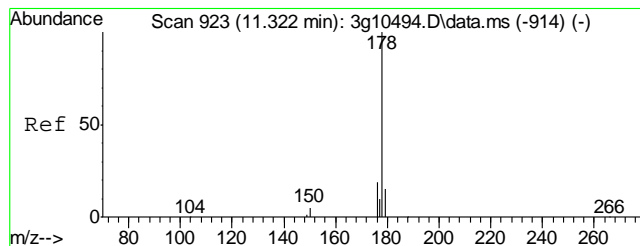
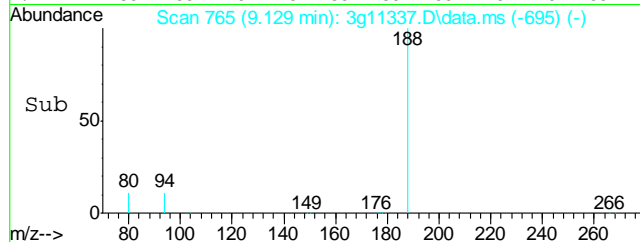
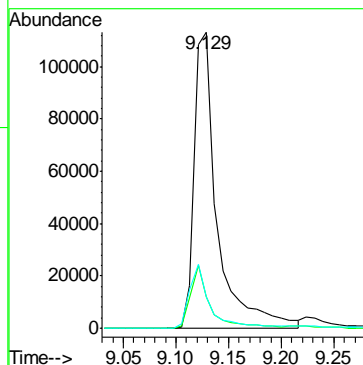
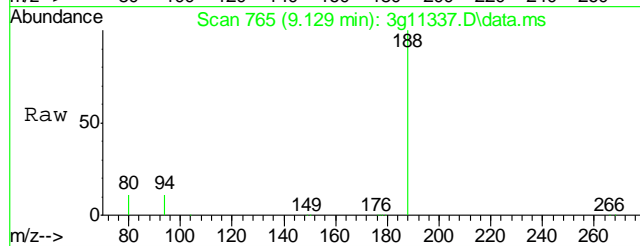
Tgt Ion:	169
Sig	Exp Ratio
169	100
168	61.0
167	32.9
167	32.9





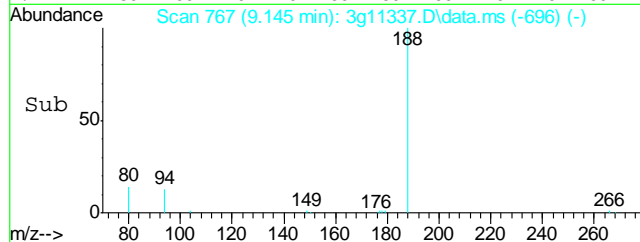
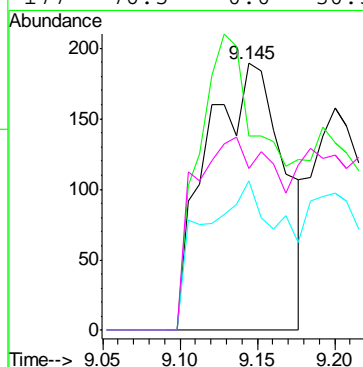
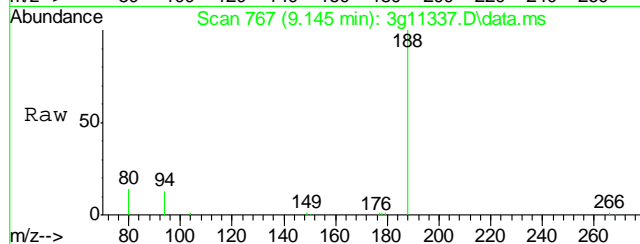
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 9.129 min Scan# 765  
Delta R.T. 0.008 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

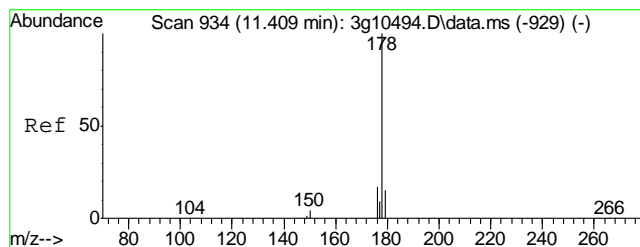
Tgt Ion	Ratio	Lower	Upper
188	100		
94	17.4	0.0	33.9
80	19.4	0.0	35.5



#16  
Phenanthrene  
Concen: Below ug/mL  
RT: 9.145 min Scan# 767  
Delta R.T. 0.008 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

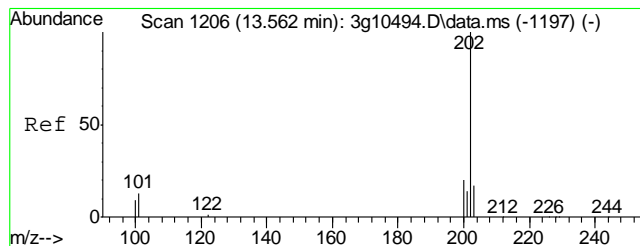
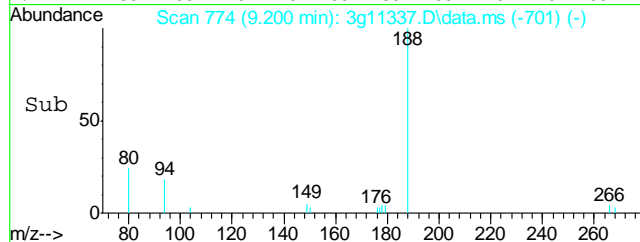
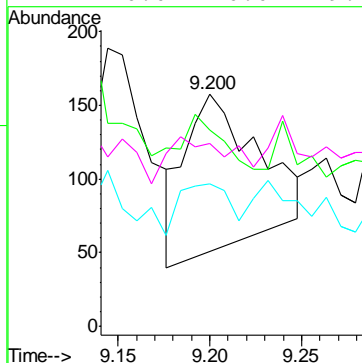
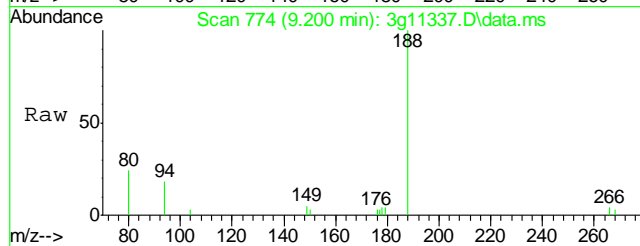
Tgt Ion	Ratio	Lower	Upper
178	100		
179	96.7	0.0	35.3#
176	47.1	0.0	38.5#
177	76.5	0.0	30.5#





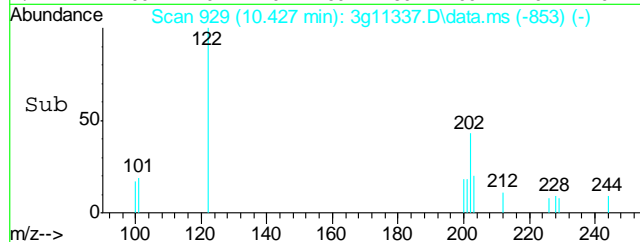
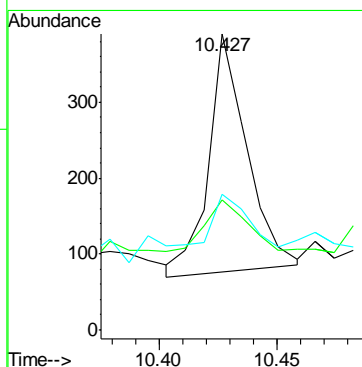
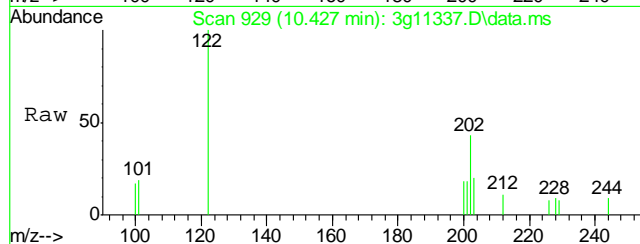
#17  
Anthracene  
Concen: Below ug/mL  
RT: 9.200 min Scan# 774  
Delta R.T. 0.008 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

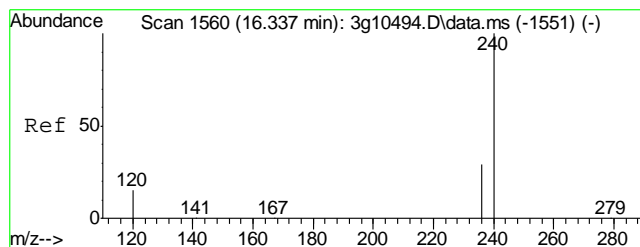
Tgt Ion: 178 Resp: 288  
Ion Ratio Lower Upper  
178 100  
179 0.0 0.0 35.2  
176 27.8 0.0 37.7  
177 0.0 0.0 29.0



#18  
Fluoranthene  
Concen: Below ug/mL  
RT: 10.427 min Scan# 929  
Delta R.T. 0.103 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

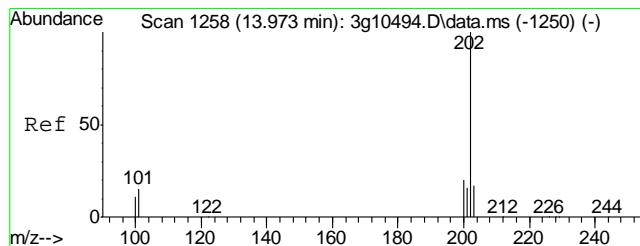
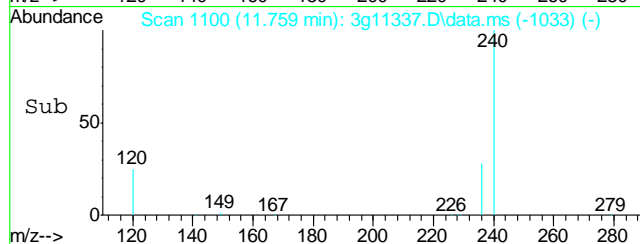
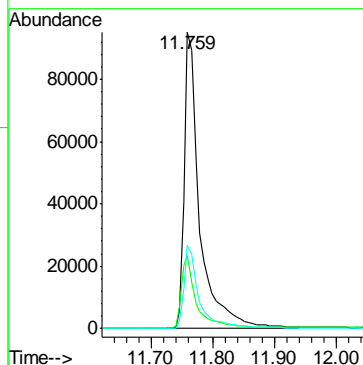
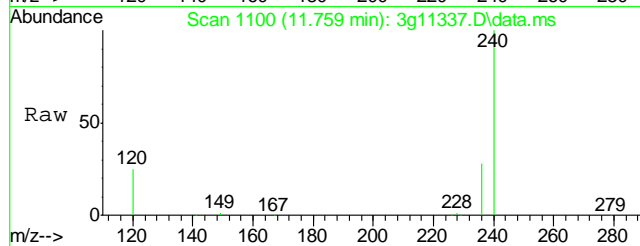
Tgt Ion: 202 Resp: 355  
Ion Ratio Lower Upper  
202 100  
101 23.1 0.0 33.0  
203 18.9 0.0 37.4





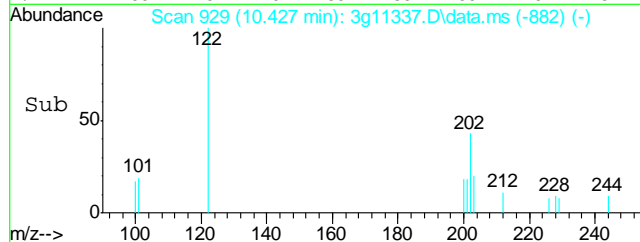
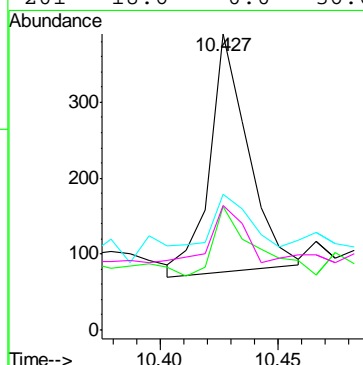
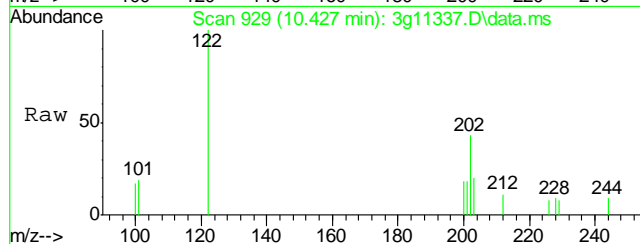
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.759 min Scan# 1100  
Delta R.T. 0.007 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

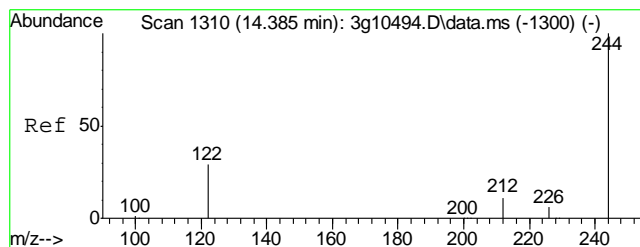
Tgt Ion:	240	Resp:	163898
Ion Ratio	Lower	Upper	
240	100		
120	23.7	0.0	36.2
236	27.4	8.8	48.8



#20  
Pyrene  
Concen: Below ug/mL  
RT: 10.427 min Scan# 929  
Delta R.T. -0.126 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

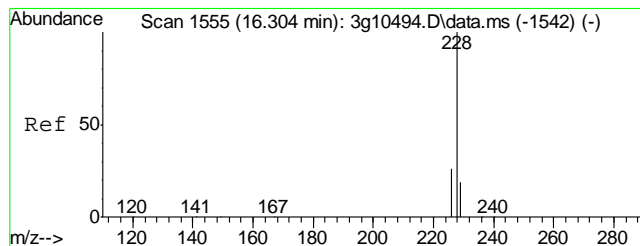
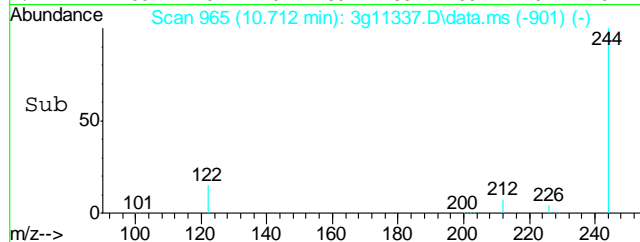
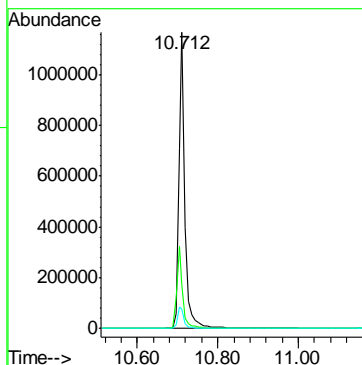
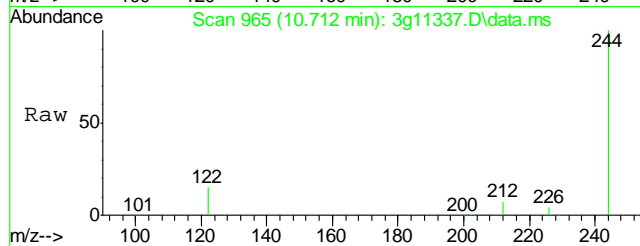
Tgt Ion:	202	Resp:	355
Ion Ratio	Lower	Upper	
202	100		
200	31.3	0.1	40.1
203	18.9	0.0	37.8
201	18.6	0.0	36.6





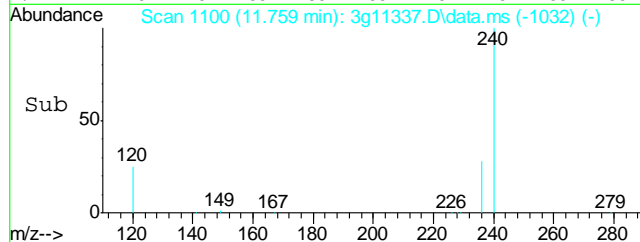
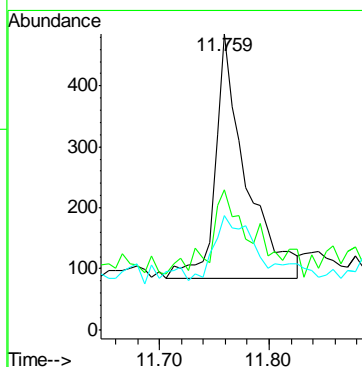
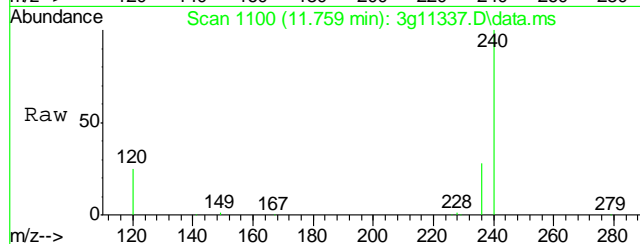
#21  
Terphenyl-d14  
Concen: 50.3449 ug/mL  
RT: 10.712 min Scan# 965  
Delta R.T. 0.008 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

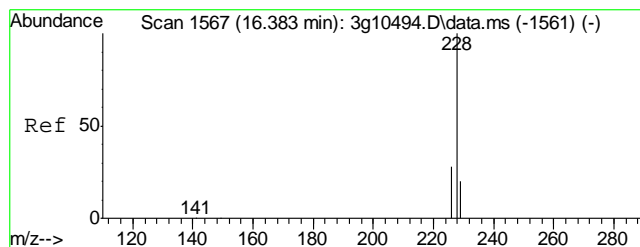
Tgt Ion: 244 Resp: 1243282  
Ion Ratio Lower Upper  
244 100  
122 27.4 1.3 41.3  
212 8.1 0.0 28.8



#22  
Benzo(a)anthracene  
Concen: Below ug/mL  
RT: 11.759 min Scan# 1100  
Delta R.T. 0.020 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

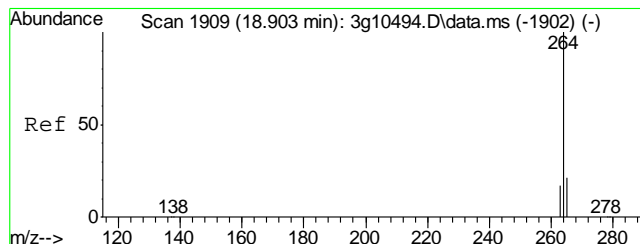
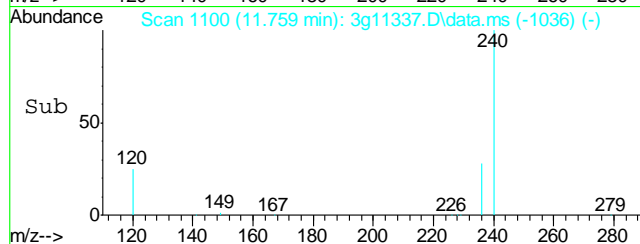
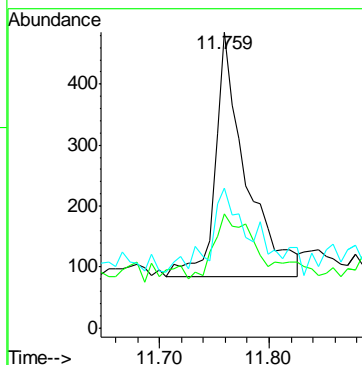
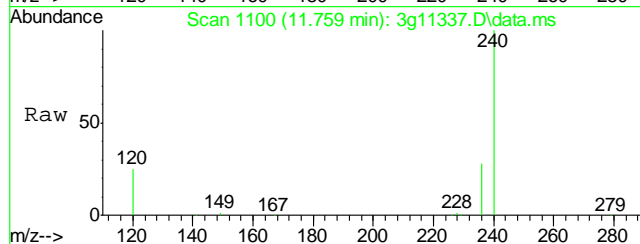
Tgt Ion: 228 Resp: 767  
Ion Ratio Lower Upper  
228 100  
229 43.8 0.0 39.6#  
226 35.3 6.6 46.6





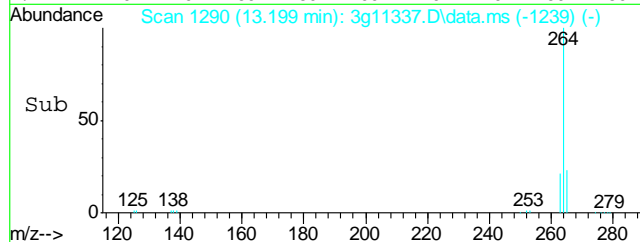
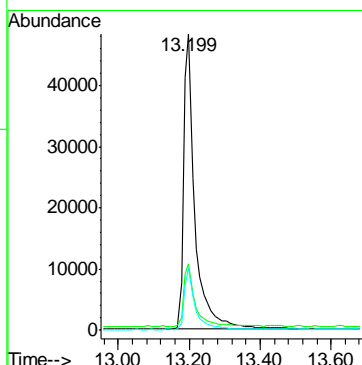
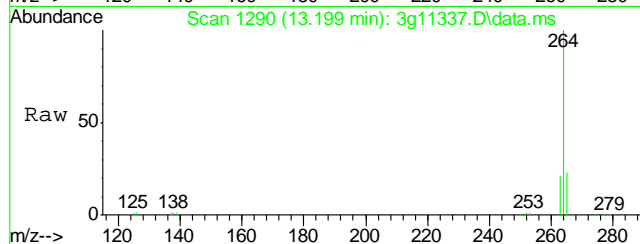
#23  
Chrysene  
Concen: Below ug/mL  
RT: 11.759 min Scan# 1100  
Delta R.T. -0.013 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

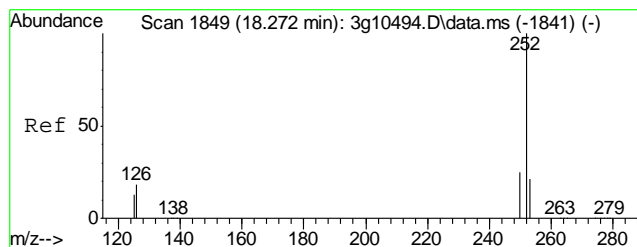
Tgt Ion	Ratio	Lower	Upper
228	100		
226	35.3	8.6	48.6
229	43.8	0.0	39.4



#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 13.199 min Scan# 1290  
Delta R.T. 0.021 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

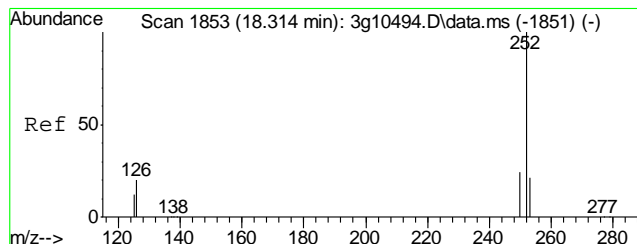
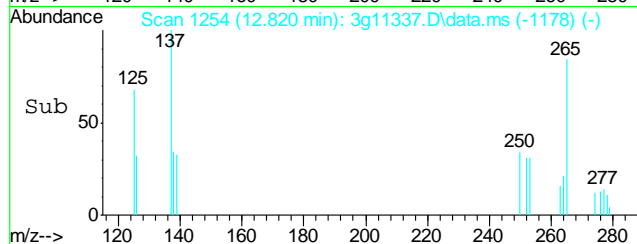
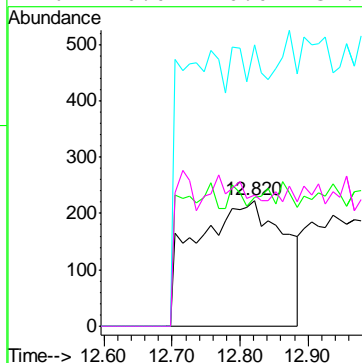
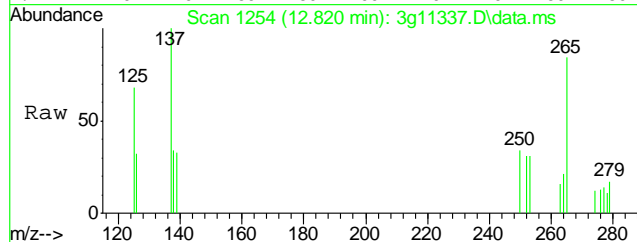
Tgt Ion	Ratio	Lower	Upper
264	100		
265	20.9	1.0	41.0
263	19.9	0.0	39.0





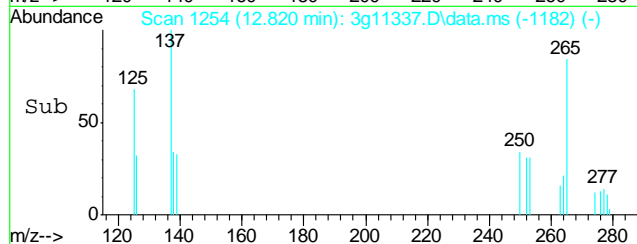
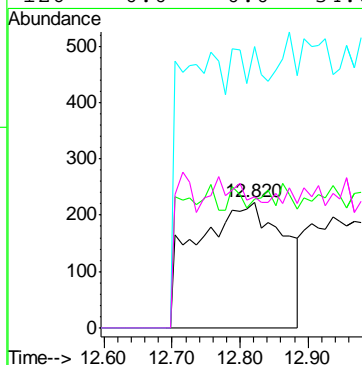
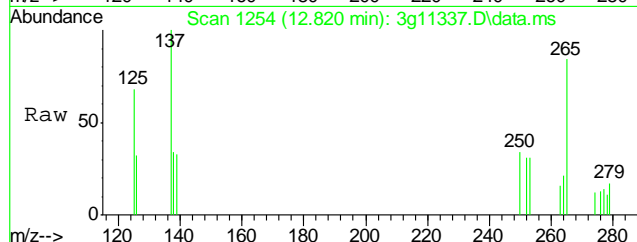
#25  
Benzo(b)fluoranthene  
Concen: Below ug/mL  
RT: 12.820 min Scan# 1254  
Delta R.T. 0.042 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion	Ratio	Lower	Upper
252	100		
253	0.0	2.9	42.9#
125	0.0	0.0	31.5
126	0.0	0.0	34.7

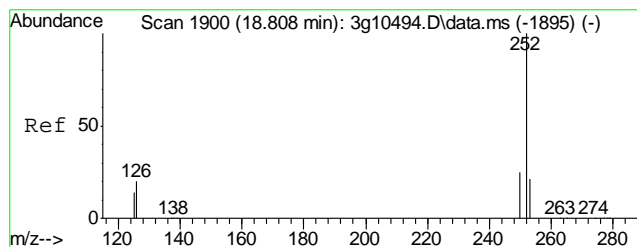


#26  
Benzo(k)fluoranthene  
Concen: Below ug/mL  
RT: 12.820 min Scan# 1254  
Delta R.T. 0.021 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion	Ratio	Lower	Upper
252	100		
253	0.0	1.8	41.8#
125	0.0	0.0	31.0
126	0.0	0.0	34.0

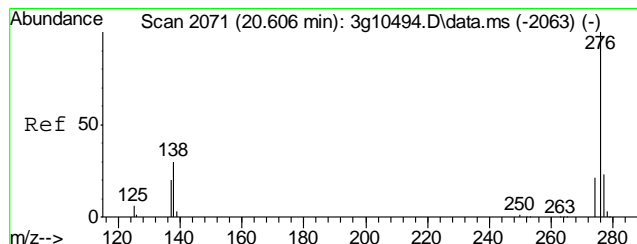
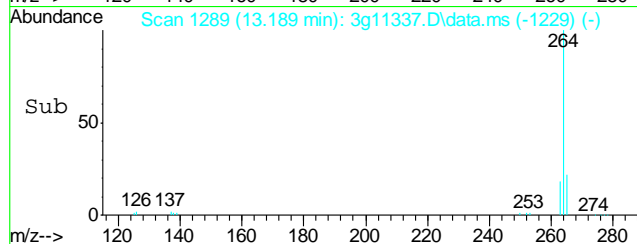
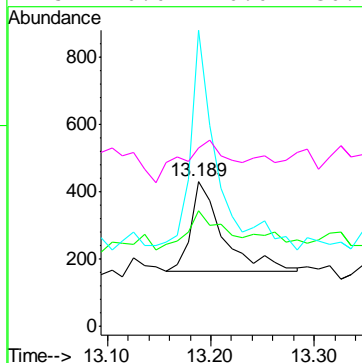
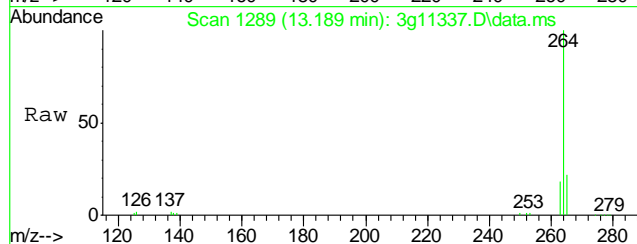






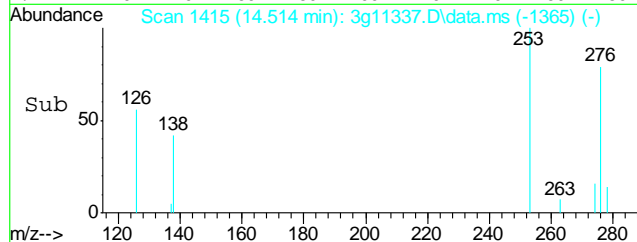
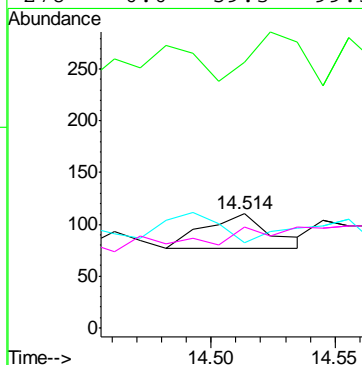
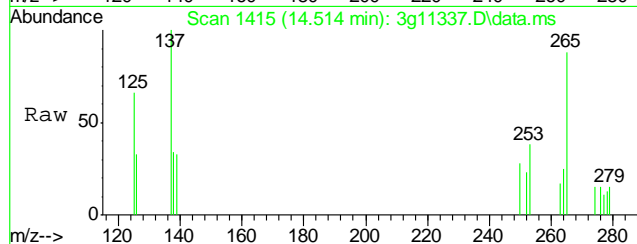
#27  
Benzo(a)pyrene  
Concen: Below ug/mL  
RT: 13.189 min Scan# 1289  
Delta R.T. 0.075 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

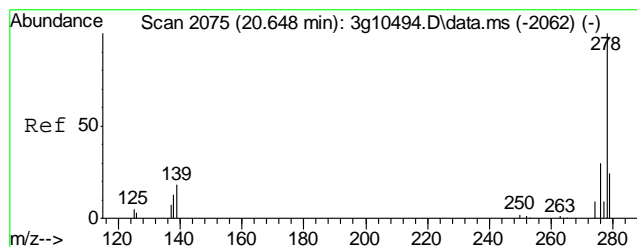
Tgt Ion	Ratio	Lower	Upper
252	100		
253	33.9	1.4	41.4
126	205.1	0.0	33.6#
125	0.0	0.0	30.7



#28  
Indeno(1,2,3-cd)pyrene  
Concen: Below ug/mL  
RT: 14.514 min Scan# 1415  
Delta R.T. 0.022 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

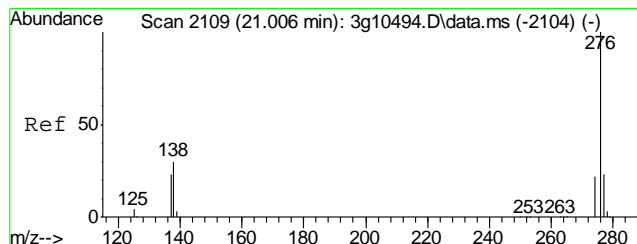
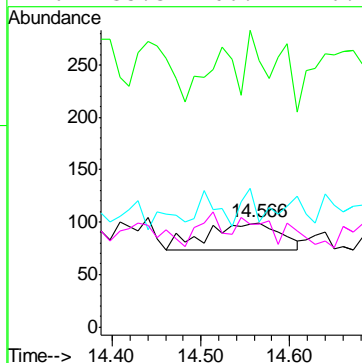
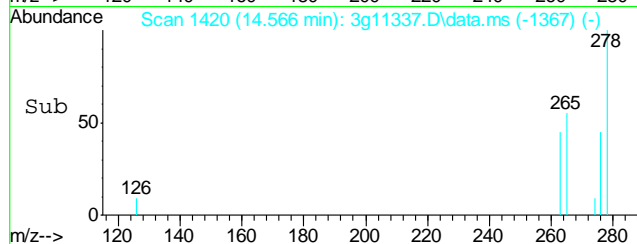
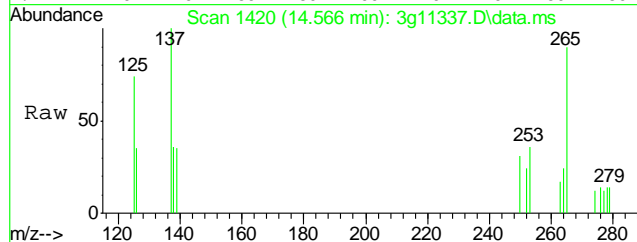
Tgt Ion	Ratio	Lower	Upper
276	100		
138	121.3	5.3	45.3#
277	0.0	5.0	45.0#
278	0.0	59.3	99.3#





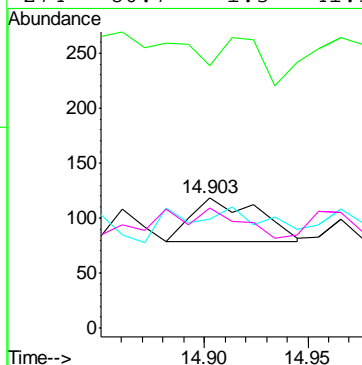
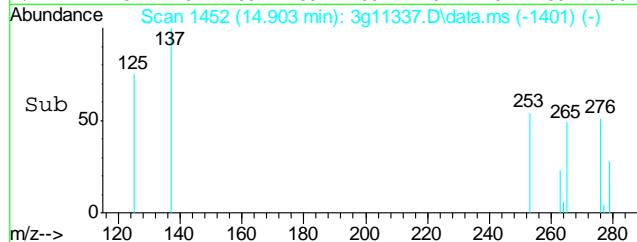
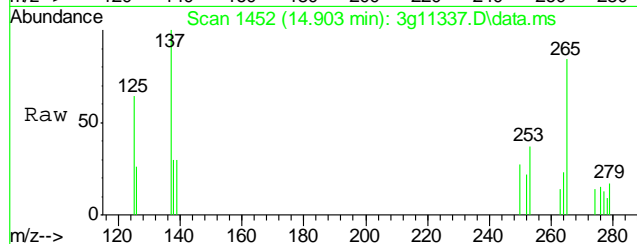
#29  
Dibenzo(a,h)anthracene  
Concen: Below ug/mL  
RT: 14.566 min Scan# 1420  
Delta R.T. 0.053 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion: 278 Resp: 153  
Ion Ratio Lower Upper  
278 100  
139 45.8 0.0 38.4#  
279 38.6 3.1 43.1  
276 35.3 106.1 146.1#



#30  
Benzo(g,h,i)perylene  
Concen: Below ug/mL  
RT: 14.903 min Scan# 1452  
Delta R.T. 0.032 min  
Lab File: 3g11337.D  
Acq: 21 Sep 12 1:44 pm

Tgt Ion: 276 Resp: 88  
Ion Ratio Lower Upper  
276 100  
138 0.0 1.3 41.3#  
277 110.2 3.4 43.4#  
274 80.7 1.3 41.3#



## GC Volatiles

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D38940  
Account: XTOKRWR XTO Energy  
Project: T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB968-MB	GB17636.D	1	09/20/12	SK	n/a	n/a	GGB968

The QC reported here applies to the following samples: Method: SW846 8015B

D38940-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	90% 60-140%

10.1.1  
10

Blank Spike Summary

Job Number: D38940  
Account: XTOKRWR XTO Energy  
Project: T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB968-BS	GB17637.D	1	09/20/12	SK	n/a	n/a	GGB968

The QC reported here applies to the following samples: Method: SW846 8015B

D38940-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	129	117	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	104%	60-140%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D38940  
Account: XTOKRWR XTO Energy  
Project: T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D38937-1MS	GB17639.D	1	09/20/12	SK	n/a	n/a	GGB968
D38937-1MSD	GB17640.D	1	09/20/12	SK	n/a	n/a	GGB968
D38937-1	GB17638.D	1	09/20/12	SK	n/a	n/a	GGB968

The QC reported here applies to the following samples: Method: SW846 8015B

D38940-1

CAS No.	Compound	D38937-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	7.98	J	138	163	113	163	113	0	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D38937-1	Limits
120-82-1	1,2,4-Trichlorobenzene	97%	93%	89%	60-140%

\* = Outside of Control Limits.

GC Volatiles

Raw Data



Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\092012\GB17643.D\FID1A.CH Vial: 10  
Signal #2 : Y:\1\DATA\092012\GB17643.D\FID2B.CH  
Acq On : 20 Sep 2012 9:23 pm Operator: StephK  
Sample : D38940-1, 50X Inst : GC/MS Ins  
Misc : GC3124,GGB968,5.086,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Sep 21 09:17:31 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Thu Sep 20 16:54:28 2012  
Response via : Initial Calibration  
DataAcq Meth : TVB4.M

Volume Inj. :  
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

	Compound	R.T.	Response	Conc	Units	
-----						
System Monitoring Compounds						
2) S	1,2,4-Trichlorobenzene	14.40	2720299	86.816 %	m	
10) S	1,2,4-Trichlorobenzene (P)	14.40	16460698	101.279 %		
Target Compounds						
1) H	TVH-Gasoline	7.23	4159709	<MDL	mg/L	
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L d	
5) T	Benzene	0.00	0	N.D.	ug/L d	
6) T	Toluene	7.70	282111	0.712	ug/L	
7) T	Ethylbenzene	0.00	0	N.D.	ug/L d	
8) T	m,p-Xylene	10.51	210162	0.202	ug/L	
9) T	o-Xylene	0.00	0	N.D.	ug/L d	
11) T	Naphthalene	14.61	2913657	14.767	ug/L	

11.1.1  
11

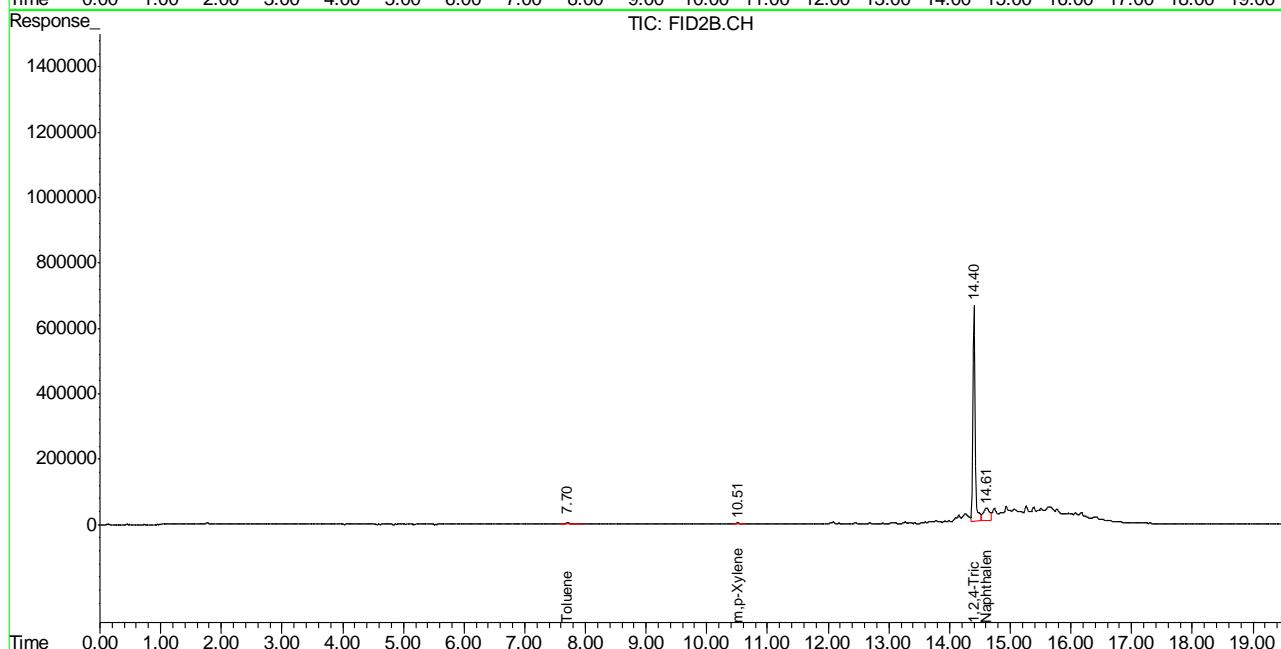
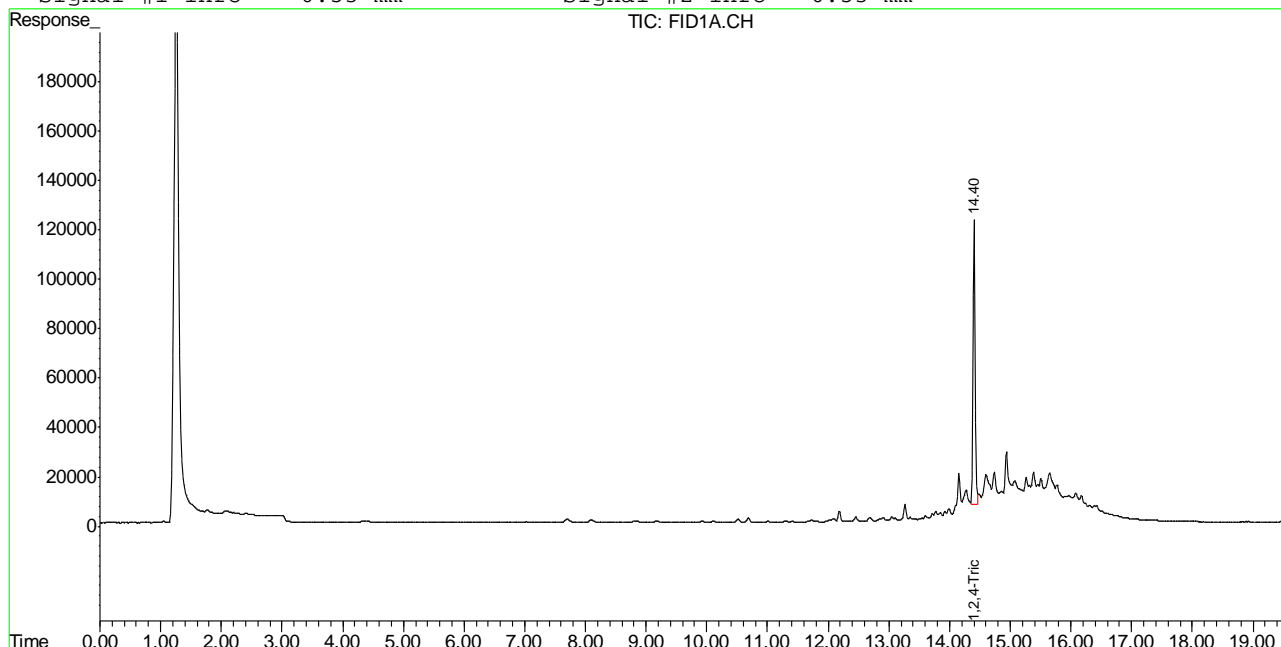


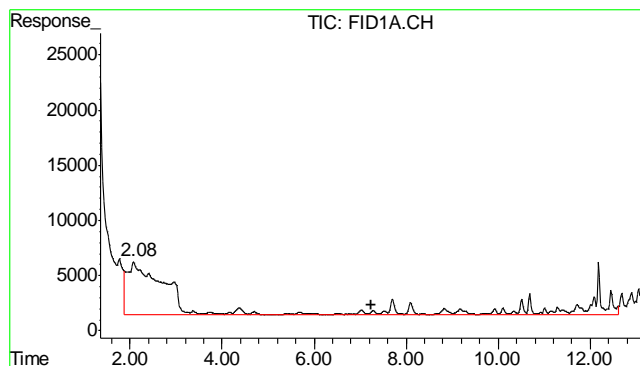
Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\092012\GB17643.D\FID1A.CH Vial: 10  
 Signal #2 : Y:\1\DATA\092012\GB17643.D\FID2B.CH  
 Acq On : 20 Sep 2012 9:23 pm Operator: StephK  
 Sample : D38940-1, 50X Inst : GC/MS Ins  
 Misc : GC3124,GGB968,5.086,,100,5,1 Multiplr: 1.00  
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
 Quant Time: Sep 21 8:27 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
 Title : 8015B/8021B TVH/BTEX  
 Last Update : Thu Sep 20 16:54:28 2012  
 Response via : Multiple Level Calibration  
 DataAcq Meth : TVB4.M

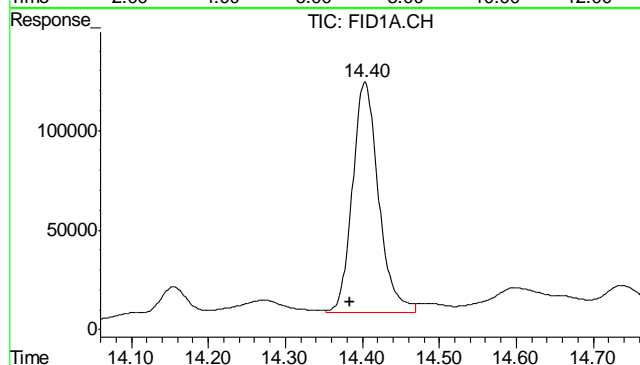
Volume Inj. :  
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





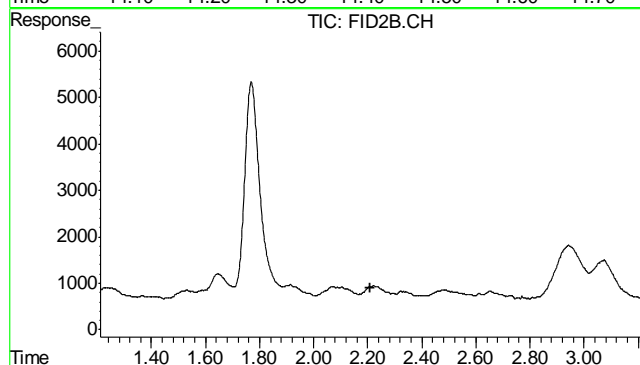
#1 TVH-Gasoline

R.T.: 7.230 min  
Delta R.T.: 0.000 min  
Response: 4159709  
Conc: N.D.



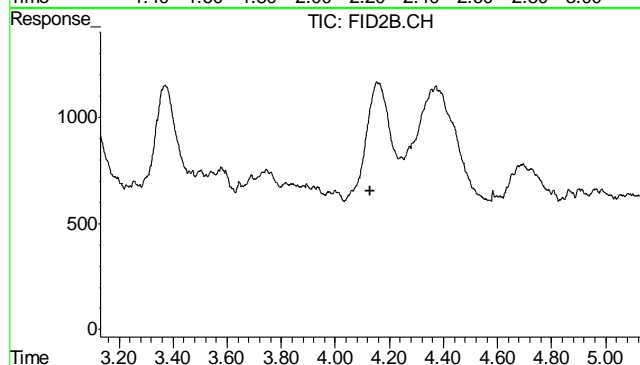
#2 1,2,4-Trichlorobenzene

R.T.: 14.403 min  
Delta R.T.: 0.018 min  
Response: 2720299  
Conc: 86.82 % m



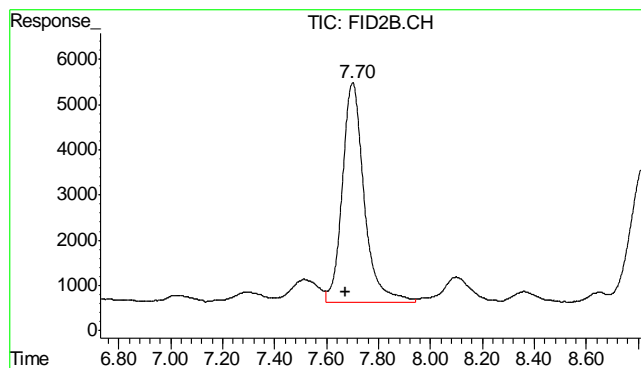
#4 Methyl-t-butyl-ether

R.T.: 0.000 min  
Exp R.T.: 2.210 min  
Response: 0  
Conc: N.D.



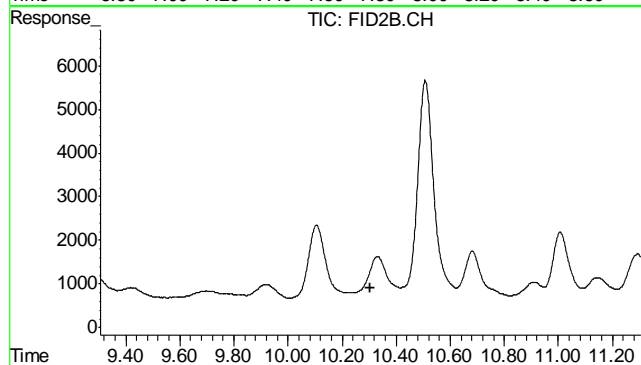
#5 Benzene

R.T.: 0.000 min  
Exp R.T.: 4.131 min  
Response: 0  
Conc: N.D.



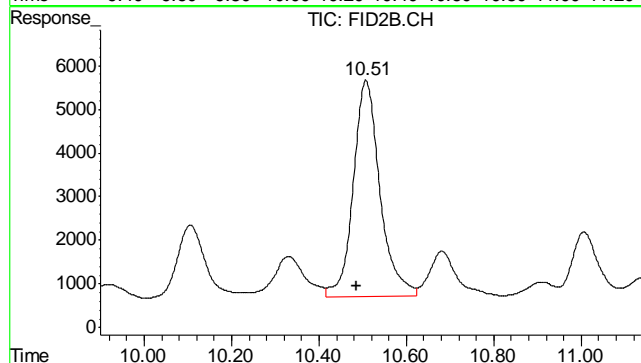
#6 Toluene

R.T.: 7.701 min  
Delta R.T.: 0.028 min  
Response: 282111  
Conc: 0.71 ug/L



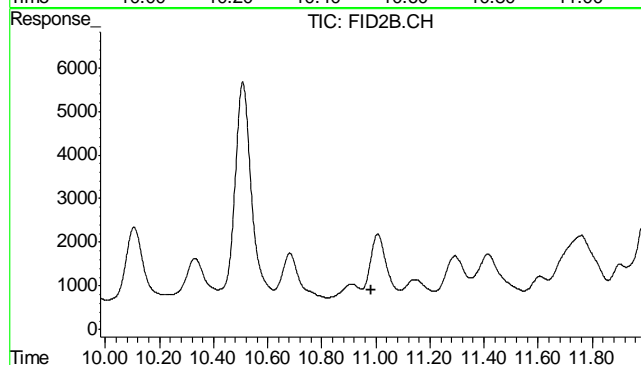
#7 Ethylbenzene

R.T.: 0.000 min  
Exp R.T.: 10.306 min  
Response: 0  
Conc: N.D.



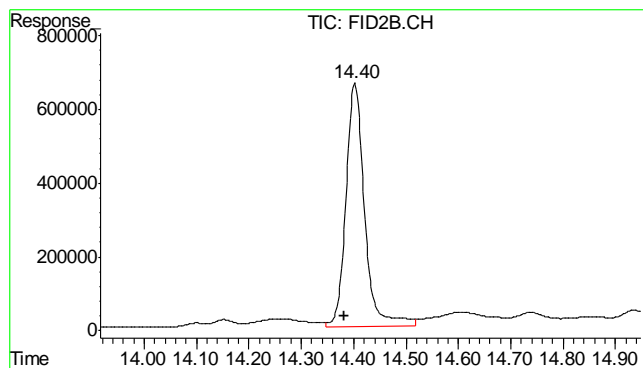
#8 m,p-Xylene

R.T.: 10.508 min  
Delta R.T.: 0.022 min  
Response: 210162  
Conc: 0.20 ug/L



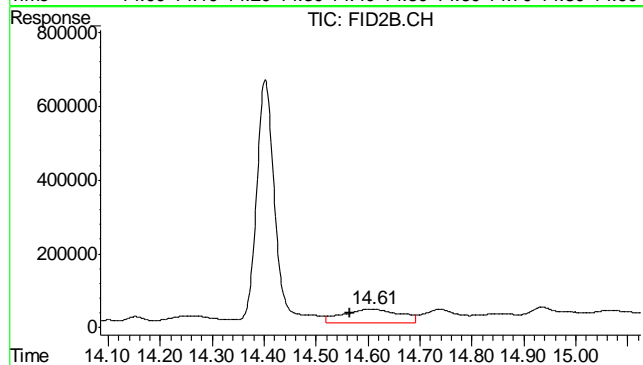
#9 o-Xylene

R.T.: 0.000 min  
Exp R.T.: 10.981 min  
Response: 0  
Conc: N.D.



#10 1,2,4-Trichlorobenzene (P)

R.T.: 14.402 min  
Delta R.T.: 0.019 min  
Response: 16460698  
Conc: 101.28 %



#11 Naphthalene

R.T.: 14.607 min  
Delta R.T.: 0.042 min  
Response: 2913657  
Conc: 14.77 ug/L

11.1.1

## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\092012\GB17636.D\FID1A.CH Vial: 3  
Signal #2 : Y:\1\DATA\092012\GB17636.D\FID2B.CH  
Acq On : 20 Sep 2012 5:14 pm Operator: StephK  
Sample : MB Inst : GC/MS Ins  
Misc : GC3124,GGB968,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Sep 21 09:17:03 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Thu Sep 20 16:54:28 2012  
Response via : Initial Calibration  
DataAcq Meth : TVB4.M

Volume Inj. :  
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

Compound		R.T.	Response	Conc	Units
-----					
System Monitoring Compounds					
2) S	1,2,4-Trichlorobenzene	14.36	2815908	89.867	%
10) S	1,2,4-Trichlorobenzene (P)	14.36	15243477	93.790	%
Target Compounds					
1) H	TVH-Gasoline	7.23	3807955	<MDL	mg/L
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L d
5) T	Benzene	0.00	0	N.D.	ug/L d
6) T	Toluene	7.65	252179	0.636	ug/L
7) T	Ethylbenzene	0.00	0	N.D.	ug/L d
8) T	m,p-Xylene	0.00	0	N.D.	ug/L d
9) T	o-Xylene	0.00	0	N.D.	ug/L d
11) T	Naphthalene	14.54	181892	0.922	ug/L

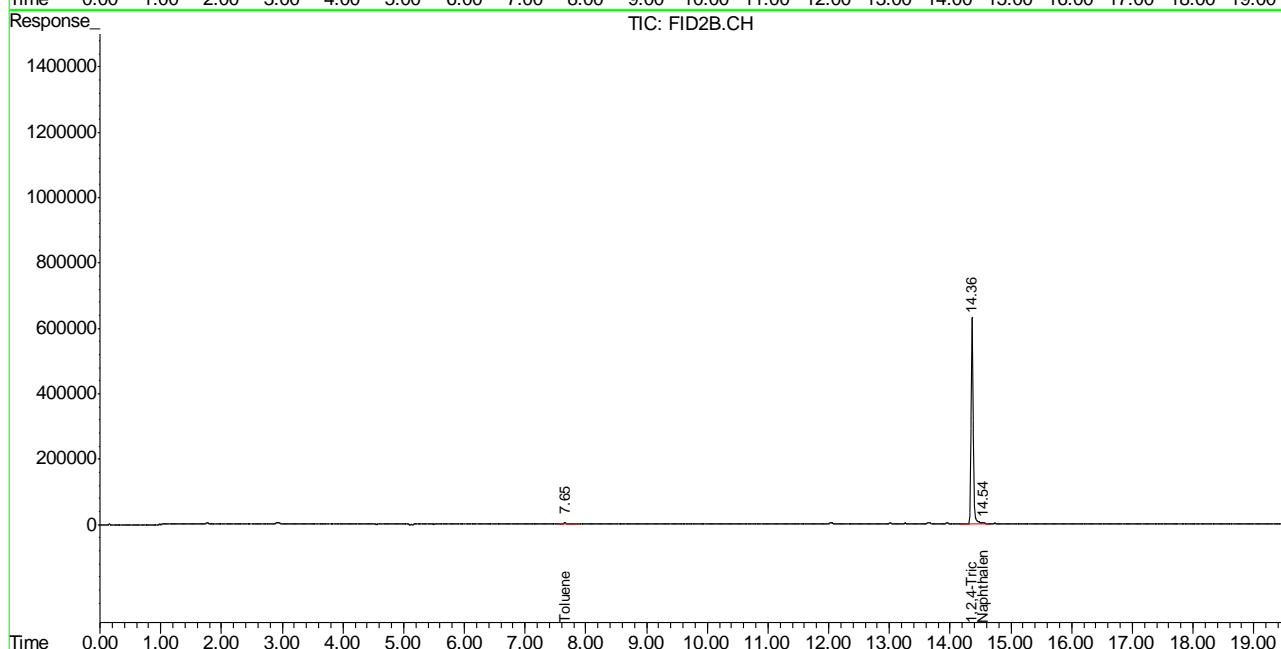
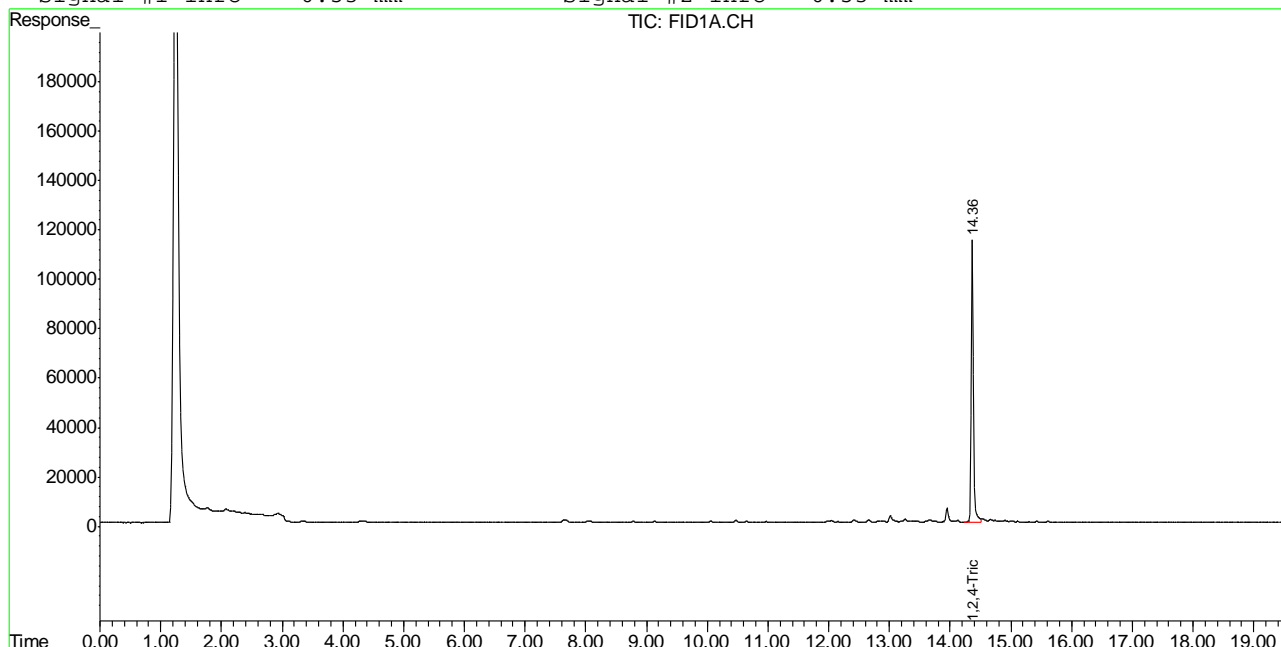
-----  
(f)=RT Delta > 1/2 Window (m)=manual int.  
GB17636.D TB868GB868SOIL.M Fri Sep 21 09:20:54 2012 GC

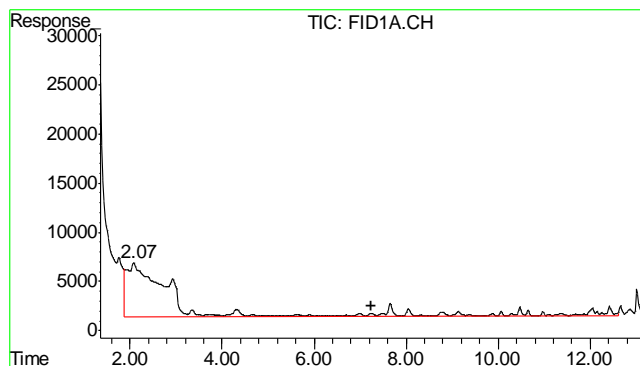
## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\092012\GB17636.D\FID1A.CH Vial: 3  
Signal #2 : Y:\1\DATA\092012\GB17636.D\FID2B.CH  
Acq On : 20 Sep 2012 5:14 pm Operator: StephK  
Sample : MB Inst : GC/MS Ins  
Misc : GC3124,GGB968,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Sep 21 8:25 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Thu Sep 20 16:54:28 2012  
Response via : Multiple Level Calibration  
DataAcq Meth : TVB4.M

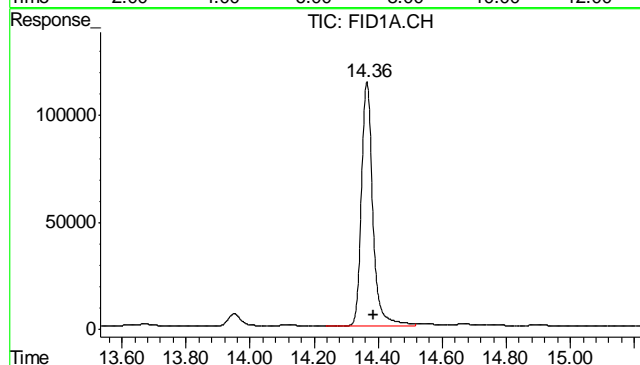
Volume Inj. :  
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





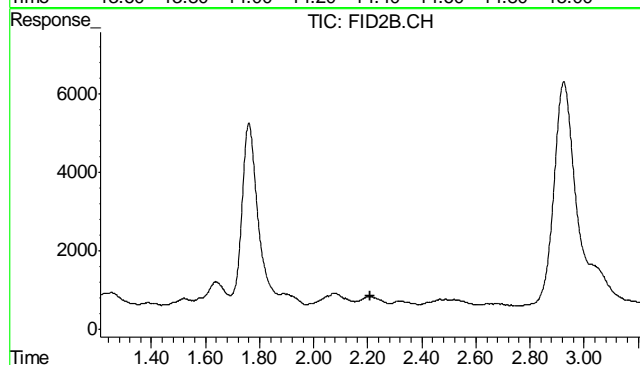
#1 TVH-Gasoline

R.T.: 7.230 min  
Delta R.T.: 0.000 min  
Response: 3807955  
Conc: N.D.



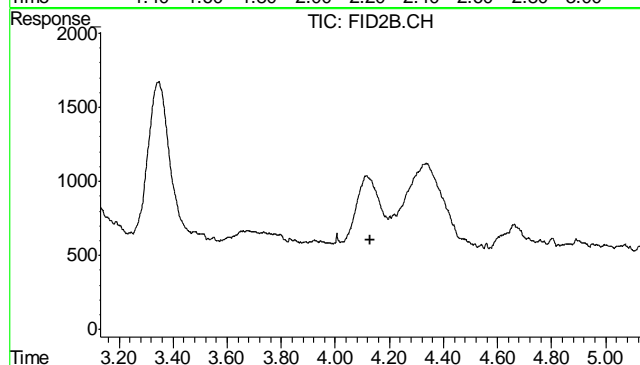
#2 1,2,4-Trichlorobenzene

R.T.: 14.365 min  
Delta R.T.: -0.020 min  
Response: 2815908  
Conc: 89.87 %



#4 Methyl-t-butyl-ether

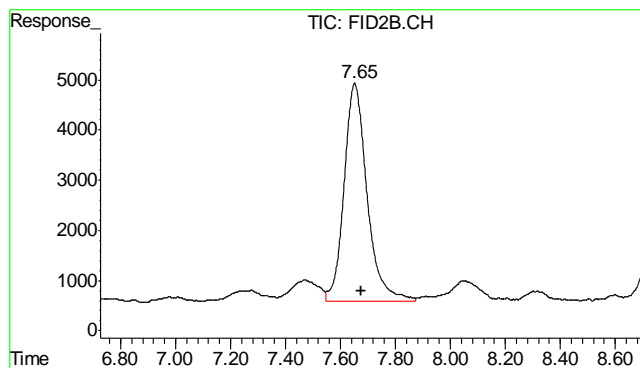
R.T.: 0.000 min  
Exp R.T.: 2.210 min  
Response: 0  
Conc: N.D.



#5 Benzene

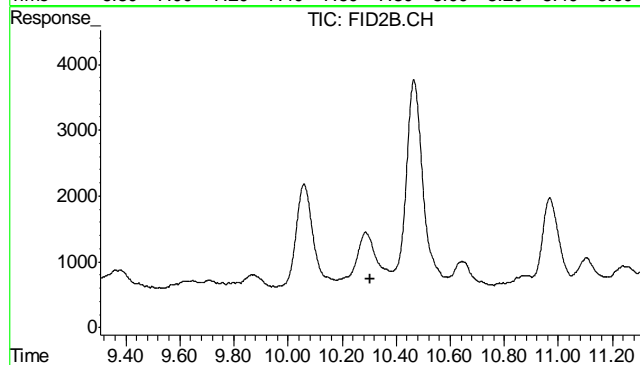
R.T.: 0.000 min  
Exp R.T.: 4.131 min  
Response: 0  
Conc: N.D.

11.21  
11



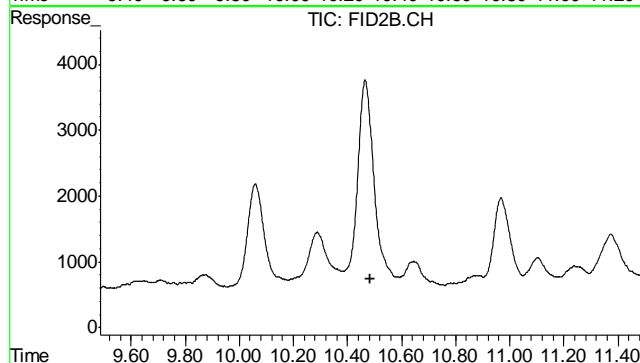
#6 Toluene

R.T.: 7.652 min  
Delta R.T.: -0.022 min  
Response: 252179  
Conc: 0.64 ug/L



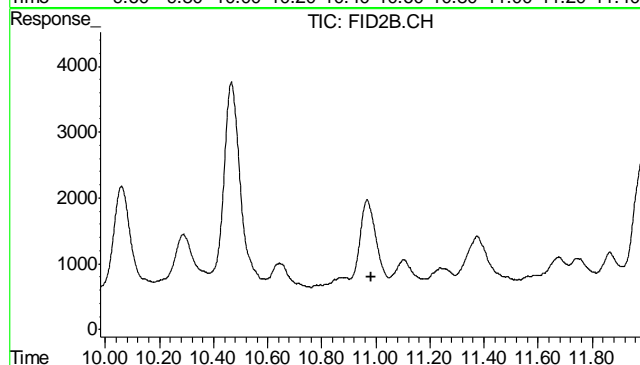
#7 Ethylbenzene

R.T.: 0.000 min  
Exp R.T.: 10.306 min  
Response: 0  
Conc: N.D.



#8 m,p-Xylene

R.T.: 0.000 min  
Exp R.T.: 10.486 min  
Response: 0  
Conc: N.D.

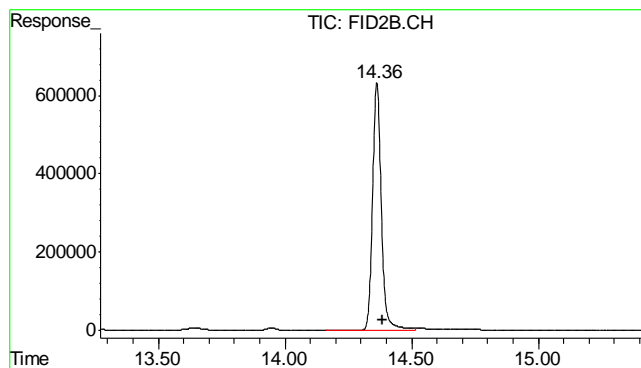


#9 o-Xylene

R.T.: 0.000 min  
Exp R.T.: 10.981 min  
Response: 0  
Conc: N.D.

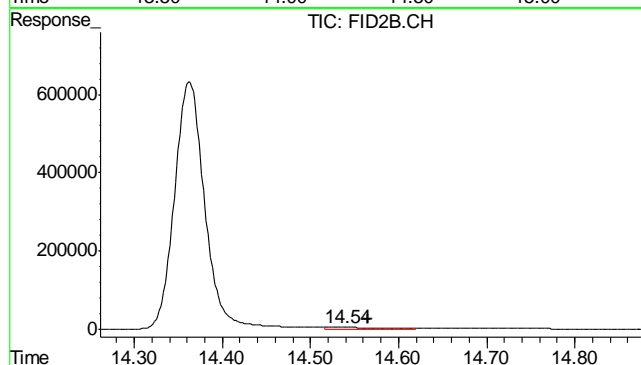
11.21  
11





#10 1,2,4-Trichlorobenzene (P)

R.T.: 14.363 min  
Delta R.T.: -0.020 min  
Response: 15243477  
Conc: 93.79 %



#11 Naphthalene

R.T.: 14.540 min  
Delta R.T.: -0.026 min  
Response: 181892  
Conc: 0.92 ug/L

11.2.1  
11

## GC Semi-volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D38940  
Account: XTOKRWR XTO Energy  
Project: T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6680-MB	FD17667.D	1	09/21/12	AV	09/21/12	OP6680	GFD904

The QC reported here applies to the following samples: Method: SW846-8015B

D38940-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	13	8.7	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	83% 43-136%

12.1.1  
12

## Blank Spike Summary

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6680-BS	FD17669.D	1	09/21/12	AV	09/21/12	OP6680	GFD904

The QC reported here applies to the following samples:

Method: SW846-8015B

D38940-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	540	81	58-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	88%	43-136%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D38940  
**Account:** XTOKRWR XTO Energy  
**Project:** T78X-12G

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6680-MS	FD17671.D	1	09/21/12	AV	09/21/12	OP6680	GFD904
OP6680-MSD	FD17673.D	1	09/21/12	AV	09/21/12	OP6680	GFD904
D38937-1	FD17675.D	1	09/21/12	AV	09/21/12	OP6680	GFD904

The QC reported here applies to the following samples:

Method: SW846-8015B

D38940-1

CAS No.	Compound	D38937-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	766		750	1300	71	1200	58	8	20-183/43

CAS No.	Surrogate Recoveries	MS	MSD	D38937-1	Limits
84-15-1	o-Terphenyl	80%	68%	80%	43-136%

\* = Outside of Control Limits.

GC Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\SEPTEMBER\FD092112\FD17679.D Vial:  
Acq On : 9-21-2012 05:27:35 PM Operator: ashleyv  
Sample : D38940-1 Inst : FID5  
Misc : OP6680,GFD904,30.16,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Sep 24 08:37:16 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Thu Sep 20 09:45:06 2012  
Response via : Initial Calibration  
DataAcq Meth : DRODUAL.M

Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um

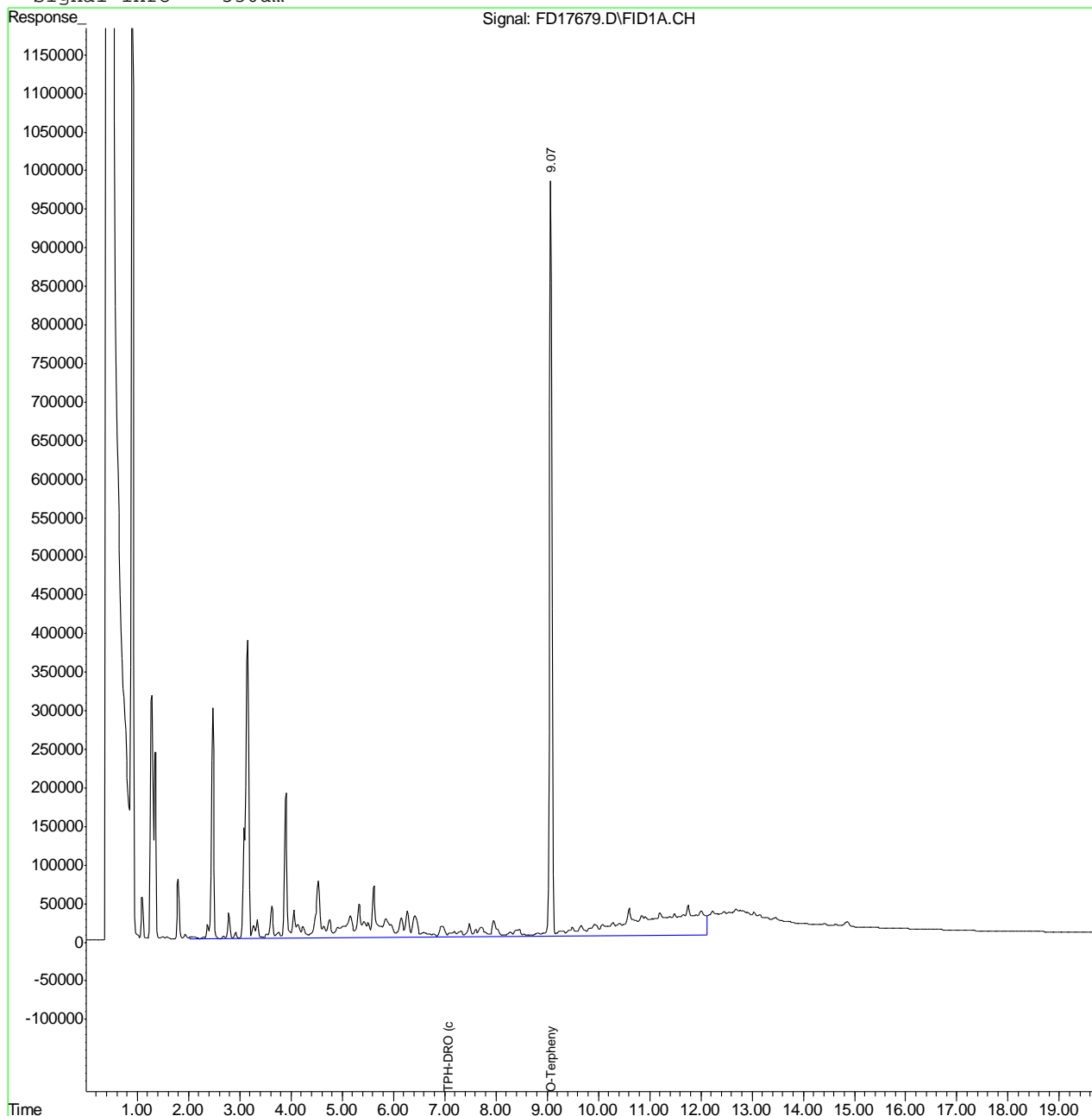
Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	9.07	33443986	707.981 mg/L m
Target Compounds			
2) H TPH-DRO (c10-c28)	7.08	109881381	2853.671 mg/L

Quantitation Report (QT Reviewed)

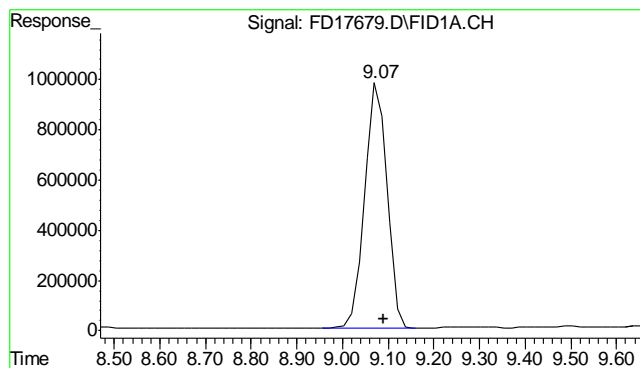
Data File : C:\MSDCHEM\2\DATA\2012\SEPTEMBER\FD092112\FD17679.D Vial: 9  
 Acq On : 9-21-2012 05:27:35 PM Operator: ashleyv  
 Sample : D38940-1 Inst : FID5  
 Misc : OP6680,GFD904,30.16,,,2,1 Multiplr: 1.00  
 IntFile : autoint1.e  
 Quant Time: Sep 24 8:37 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
 Title : 8015B TEH  
 Last Update : Thu Sep 20 09:45:06 2012  
 Response via : Multiple Level Calibration  
 DataAcq Meth : DRODUAL.M

Volume Inj. : 1ul  
 Signal Phase : RTX-5  
 Signal Info : 530um

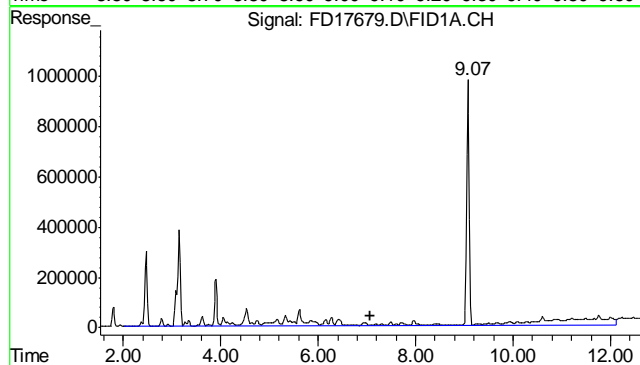






#1 O-Terphenyl

R.T.: 9.073 min  
 Delta R.T.: -0.017 min  
 Response: 33443986  
 Conc: 707.98 mg/L m



#2 TPH-DRO (c10-c28)

R.T.: 7.075 min  
 Delta R.T.: 0.000 min  
 Response: 109881381  
 Conc: 2853.67 mg/L m

## Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\SEPTEMBER\FD092112\FD17667.D Vial: 3  
Acq On : 21 Sep 2012 11:08 am Operator: ashleyv  
Sample : OP6680-MB Inst : FID5  
Misc : OP6680,GFD904,30.00,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Sep 24 08:29:42 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Thu Sep 20 09:45:06 2012  
Response via : Initial Calibration  
DataAcq Meth : DRODUAL.M

Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um

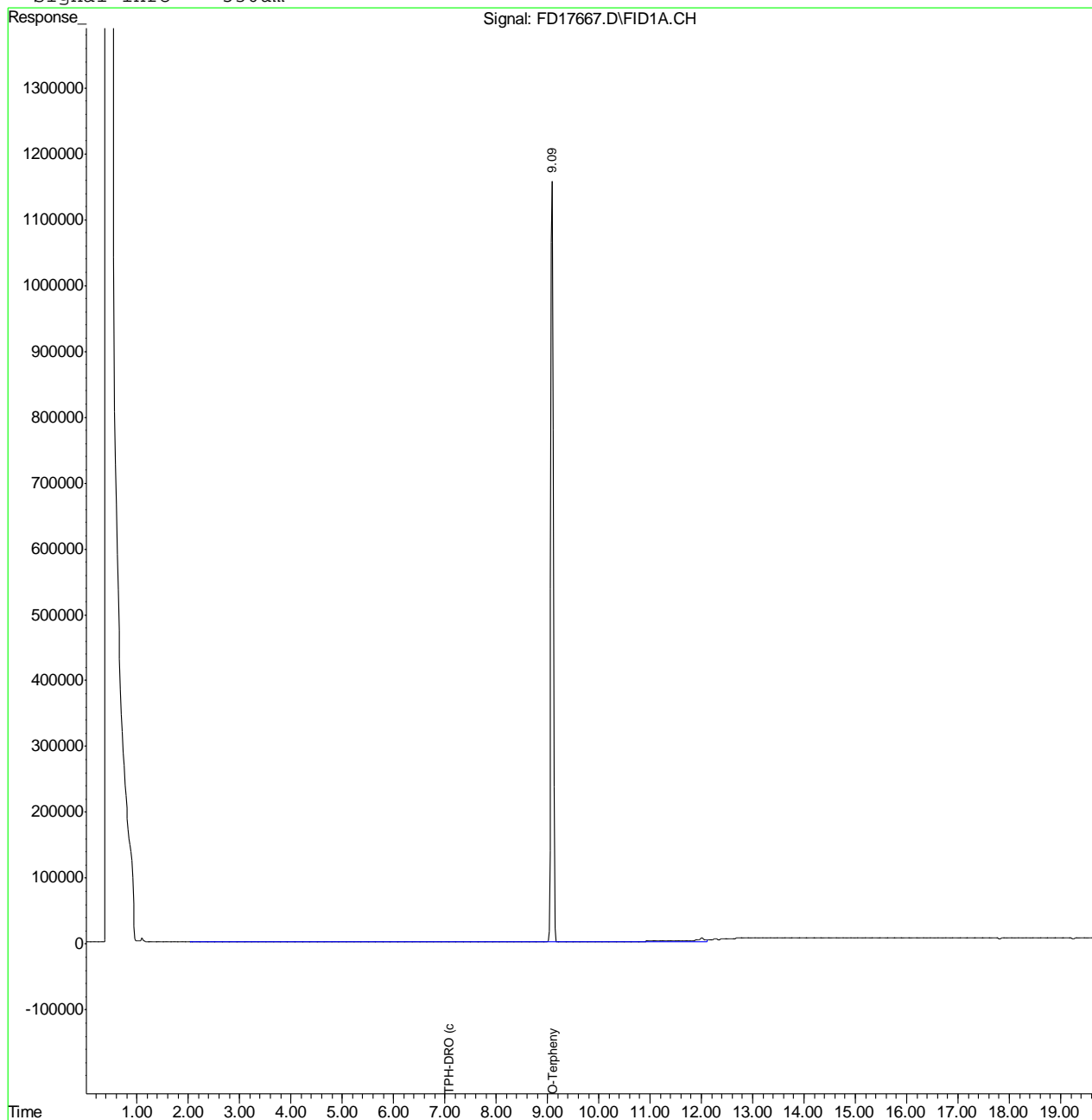
Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	9.10	39395781	833.976 mg/L
Target Compounds			
2) H TPH-DRO (c10-c28)	7.08	2216184	57.555 mg/L

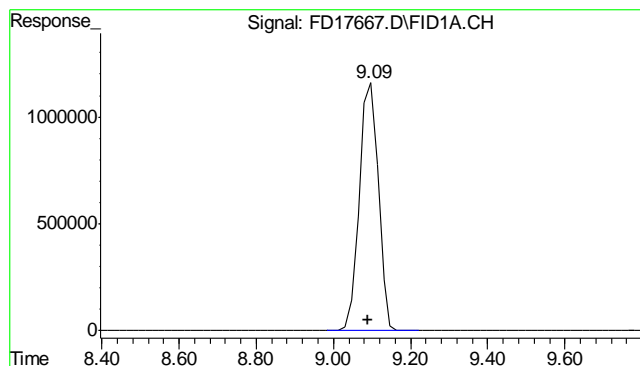
## Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\SEPTEMBER\FD092112\FD17667.D Vial: 3  
Acq On : 21 Sep 2012 11:08 am Operator: ashleyv  
Sample : OP6680-MB Inst : FID5  
Misc : OP6680,GFD904,30.00,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Sep 24 8:29 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Thu Sep 20 09:45:06 2012  
Response via : Multiple Level Calibration  
DataAcq Meth : DRODUAL.M

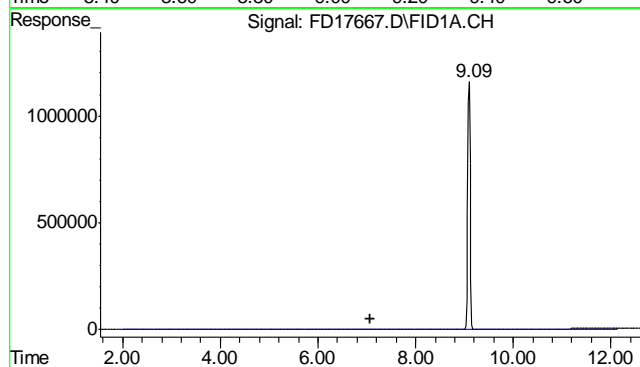
Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um





#1 O-Terphenyl

R.T.: 9.099 min  
Delta R.T.: 0.009 min  
Response: 39395781  
Conc: 833.98 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 7.075 min  
Delta R.T.: 0.000 min  
Response: 2216184  
Conc: 57.56 mg/L m

13.2.1  
13

## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 09/24/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.96	.57		
Antimony	3.0	.17	.12		
Arsenic	2.5	.44	.56		
Barium	1.0	.01	.11	0.090	<1.0
Beryllium	1.0	.13	.15		
Boron	5.0	.1	.06		
Cadmium	1.0	.06	.036	0.0	<1.0
Calcium	40	.54	9		
Chromium	1.0	.03	.03	0.020	<1.0
Cobalt	0.50	.04	.07		
Copper	1.0	.12	.15	-0.080	<1.0
Iron	7.0	.12	.87		
Lead	5.0	.19	.24	0.10	<5.0
Lithium	0.20	.05	.054		
Magnesium	20	.65	.98		
Manganese	0.50	.12	.022		
Molybdenum	1.0	.21	.08		
Nickel	3.0	.05	.026	-0.020	<3.0
Phosphorus	10	1.4	1.9		
Potassium	200	6.1	7		
Selenium	5.0	.48	.36	-0.41	<5.0
Silicon	5.0	.29	.37		
Silver	3.0	.04	.06	-0.13	<3.0
Sodium	40	.59	1.9		
Strontium	5.0	.004	.017		
Thallium	1.0	.29	.53		
Tin	5.0	1.2	2		
Titanium	1.0	.01	.038		
Uranium	5.0	.22	.26		
Vanadium	1.0	.02	.036		
Zinc	3.0	.05	.37	0.090	<3.0

Associated samples MP8469: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 09/24/12

Metal	D38897-1 Original MS		Spikelot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	500	692	233	90.9	75-125
Beryllium					
Boron					
Cadmium	0.18	52.9	58.3	90.4	75-125
Calcium	anr				
Chromium	65.2	121	58.3	89.4	75-125
Cobalt					
Copper	12.1	67.4	58.3	94.8	75-125
Iron					
Lead	9.6	117	117	92.1	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	22.5	71.6	58.3	84.2	75-125
Phosphorus					
Potassium					
Selenium	0.0	104	117	89.2	75-125
Silicon					
Silver	0.069	22.5	23.3	96.2	75-125
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	41.1	89.9	58.3	83.7	75-125

Associated samples MP8469: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 09/24/12

Metal	D38897-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	500	738	233	110.6	6.4	20
Beryllium						
Boron						
Cadmium	0.18	53.2	58.3	91.0	0.6	20
Calcium	anr					
Chromium	65.2	124	58.3	94.5	2.4	20
Cobalt						
Copper	12.1	65.9	58.3	92.3	2.3	20
Iron						
Lead	9.6	115	117	90.4	1.7	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	22.5	71.3	58.3	83.7	0.4	20
Phosphorus						
Potassium						
Selenium	0.0	105	117	90.0	1.0	20
Silicon						
Silver	0.069	22.7	23.3	97.0	0.9	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	41.1	89.4	58.3	82.8	0.6	20

Associated samples MP8469: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

14.1.2  
14

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 09/24/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	182	200	91.0	80-120
Beryllium				
Boron				
Cadmium	47.3	50	94.6	80-120
Calcium	anr			
Chromium	50.3	50	100.6	80-120
Cobalt				
Copper	44.4	50	88.8	80-120
Iron				
Lead	98.4	100	98.4	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	47.5	50	95.0	80-120
Phosphorus				
Potassium				
Selenium	93.7	100	93.7	80-120
Silicon				
Silver	19.7	20	98.5	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	45.6	50	91.2	80-120

Associated samples MP8469: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 09/24/12

Metal	D38897-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	4370	4600	9.4	0-10
Beryllium				
Boron				
Cadmium	1.60	0.00	100.0(a)	0-10
Calcium	anr			
Chromium	570	671	11.1*(b)	0-10
Cobalt				
Copper	106	102	4.5	0-10
Iron				
Lead	84.3	89.0	5.6	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	197	229	16.1*(b)	0-10
Phosphorus				
Potassium				
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.600	0.00	100.0(a)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	400	418	16.2*(b)	0-10

Associated samples MP8469: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8469  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested  
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).  
(b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8470  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 09/24/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.22	.31		
Antimony	0.20	.0018	.0075		
Arsenic	0.10	.006	.06	0.0024	<0.10
Barium	1.0	.0065	.037		
Beryllium	0.10	.016	.09		
Boron	20	1.2	1.2		
Cadmium	0.050	.014	.021		
Calcium	200	7.9	8		
Chromium	1.0	.033	.19		
Cobalt	0.10	.0012	.015		
Copper	1.0	.017	.065		
Iron	20	.8	5		
Lead	0.25	.0011	.024		
Magnesium	50	.44	.85		
Manganese	0.50	.0043	.02		
Molybdenum	0.50	.018	.018		
Nickel	1.0	.0049	.011		
Phosphorus	30	1.4	3.6		
Potassium	100	9.8	10		
Selenium	0.20	.029	.14		
Silver	0.050	.0009	.0065		
Sodium	250	1.5	2.3		
Strontium	10	.036	.036		
Thallium	0.10	.00095	.0095		
Tin	5.0	.023	.34		
Titanium	1.0	.044	.1		
Uranium	0.25	.00085	.001		
Vanadium	2.0	.12	.21		
Zinc	5.0	.033	.35		

Associated samples MP8470: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8470  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 09/24/12

Metal	D38897-1 Original MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	6.7	124	117	100.6
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP8470: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

14.2.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8470  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 09/24/12

Metal	D38897-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	6.7	123	117	99.7	0.8	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP8470: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

14.2.2  
14

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D38940  
 Account: XTOKRWR - XTO Energy  
 Project: T78X-12G

QC Batch ID: MP8470  
 Matrix Type: SOLID

Methods: SW846 6020A  
 Units: mg/kg

Prep Date: 09/24/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	103	100	103.0	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP8470: D38940-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

14.2.3  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D38940  
 Account: XTOKRWR - XTO Energy  
 Project: T78X-12G

QC Batch ID: MP8470  
 Matrix Type: SOLID

Methods: SW846 6020A  
 Units: ug/l

Prep Date: 09/24/12

Metal	D38897-1			QC	
	Original	SDL 5:25	%DIF	Limits	
Aluminum					
Antimony					
Arsenic	58.3	56.1	3.7	0-10	
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP8470: D38940-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

14.2.4  
14

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8479  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 09/25/12

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Mercury	0.10	.0011	.0009	0.00063	<0.10
---------	------	-------	-------	---------	-------

Associated samples MP8479: D38940-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
 Account: XTOKRWR - XTO Energy  
 Project: T78X-12G

QC Batch ID: MP8479  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 09/25/12

Metal	D38939-1 Original MS	Spikelot HGWSR1	% Rec	QC Limits
-------	-------------------------	--------------------	-------	--------------

Mercury	0.021	0.45	0.431	99.5	75-125
---------	-------	------	-------	------	--------

Associated samples MP8479: D38940-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
 Account: XTOKRWR - XTO Energy  
 Project: T78X-12G

QC Batch ID: MP8479  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 09/25/12

Metal	D38939-1 Original	MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.021	0.45	0.431	99.5	0.0	

Associated samples MP8479: D38940-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D38940  
 Account: XTOKRWR - XTO Energy  
 Project: T78X-12G

QC Batch ID: MP8479  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 09/25/12

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.40	0.4	100.0	80-120

Associated samples MP8479: D38940-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 09/24/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	48	130		
Antimony	150	8.5	18		
Arsenic	130	22	42		
Barium	50	.5	9		
Beryllium	50	6.5	16		
Boron	250	5	22		
Cadmium	50	3	3		
Calcium	2000	27	80	24.0	<2000
Chromium	50	1.5	2.8		
Cobalt	25	2	2.1		
Copper	50	6	15		
Iron	350	6	100		
Lead	250	9.5	15		
Lithium	10	2.5			
Magnesium	1000	33	110	2.5	<1000
Manganese	25	6	6		
Molybdenum	50	11	11		
Nickel	150	2.5	2.9		
Phosphorus	500	70	300		
Potassium	5000	310	750		
Selenium	250	24	55		
Silicon	250	15			
Silver	150	2	4.9		
Sodium	2000	30	490	585	<2000
Strontium	25	.2	7.5		
Thallium	50	15	43		
Tin	250	60			
Titanium	50	.5			
Uranium	250	11	23		
Vanadium	50	1	2.4		
Zinc	150	2.5	12		

Associated samples MP8480: D38940-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

14.4.1

14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 09/24/12

Metal	D38940-1A Original MS		Spikelot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	1050000	1270000	125000	176.0(a)	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	0.00	125000	125000	100.0	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	818000	1000000	125000	145.6(a)	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP8480: D38940-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.4.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

14.4.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 09/24/12

Metal	D38940-1A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	1050000	1310000	125000	208.0(a)	3.1	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	0.00	127000	125000	101.6	1.6	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	818000	1040000	125000	177.6(a)	3.9	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP8480: D38940-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.4.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 09/24/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	137000	125000	109.6	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	127000	125000	101.6	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	132000	125000	105.6	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP8480: D38940-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.4.3  
14

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested



SERIAL DILUTION RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 09/24/12

Metal	D38940-1A Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	210000	216000	2.6	0-10
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	0.00	0.00	NC	0-10
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	164000	167000	2.4	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP8480: D38940-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.4.4  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

QC Batch ID: MP8480  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

14.4.4  
14

## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP8246/GN16921	1.0	0.0	mg/kg	60.7	66.4	109.0	80-120%
Specific Conductivity	GP8271/GN16934			umhos/cm	99.9	9980	99.9	90-110%
pH	GN16879			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:  
Batch GP8246: D38940-1  
Batch GP8271: D38940-1  
Batch GN16879: D38940-1  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP8246/GN16921	D38939-1	mg/kg	0.0	0.0	31.4(a)	0-20%
Redox Potential Vs H2	GN16882	D38940-1	mv	13.5	13.0	3.8	0-20%

Associated Samples:

Batch GP8246: D38940-1

Batch GN16882: D38940-1

(\*) Outside of QC limits

(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP8246/GN16921	D38939-1	mg/kg	0.0	40	39.5	98.8	75-125%

Associated Samples:

Batch GP8246: D38940-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D38940  
Account: XTOKRWR - XTO Energy  
Project: T78X-12G

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Chromium, Hexavalent	GP8246/GN16921	D38939-1	mg/kg	0.0	40	40.4	2.2	

Associated Samples:  
Batch GP8246: D38940-1  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits