



11/05/12

## Technical Report for

**XTO Energy**

**PCU 296-5A**

**1210-04**

**Accutest Job Number: D40328**

**Sampling Date: 10/25/12**

### Report to:

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**Total number of pages in report: 138**



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

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

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Test results relate only to samples analyzed.

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Sample Summary

XTO Energy

Job No: D40328

PCU 296-5A  
Project No: 1210-04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D40328-1	10/25/12	13:00 DK	10/27/12	SO	Soil	FW SUBLINER COMP
D40328-1A	10/25/12	13:00 DK	10/27/12	SO	Soil	FW SUBLINER COMP

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



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy

**Job No** D40328

**Site:** PCU 296-5A

**Report Dat** 11/5/2012 1:29:12 PM

On 10/27/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D40328 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

**Matrix** SO

**Batch ID:** V5V1486

- All samples were analyzed within the recommended method holding time.
- Sample(s) D40126-1MS, D40126-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

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

**Matrix** SO

**Batch ID:** OP6884

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D40329-1MS, D40329-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of Chrysene are outside control limits. Outside control limits due to matrix interference.
- Sample(s) OP6884-MS have surrogates outside control limits. Probable cause due to matrix interference.
- D40328-1: Elevated reporting limits due to matrix interference, dilution required during sample prep.
- OP6884-MS for Nitrobenzene-d5: Outside control limits due to matrix interference.

### Volatiles by GC By Method SW846 8015B

**Matrix** SO

**Batch ID:** GGB998

- All samples were analyzed within the recommended method holding time.
- Sample(s) D40315-1MS, D40315-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

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

**Matrix** SO

**Batch ID:** OP6873

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D40313-4MS, D40313-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

## Metals By Method SW846 6010C

**Matrix** AQ

**Batch ID:** MP8775

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40339-2MSD, D40339-2SDL, D40339-2MS, D40339-2MSD were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Sodium, Calcium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The serial dilution RPD(s) for Magnesium are outside control limits for sample MP8775-SD1. Probable cause due to sample homogeneity.
- MP8775-SD1 for Magnesium: Serial dilution indicates possible matrix interference.

**Matrix** SO

**Batch ID:** MP8772

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40329-1MS, D40329-1MSD, D40329-1SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery(s) of Zinc are outside control limits. Probable cause due to matrix interference.
- The matrix spike (MS) recovery(s) of Barium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The RPD(s) for the MS and MSD recoveries of Barium are outside control limits for sample MP8772-S2. High RPD due to possible sample matrix or nonhomogeneity.
- The serial dilution RPD(s) for Selenium, Barium, Chromium, Lead, Nickel, Zinc are outside control limits for sample MP8772-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP8772-SD1 for Lead: Serial dilution indicates possible matrix interference.
- MP8772-SD1 for Nickel: Serial dilution indicates possible matrix interference.
- MP8772-SD1 for Zinc: Serial dilution indicates possible matrix interference.
- MP8772-SD1 for Chromium: Serial dilution indicates possible matrix interference.
- MP8772-SD1 for Barium: Serial dilution indicates possible matrix interference.

## Metals By Method SW846 6020A

**Matrix** SO

**Batch ID:** MP8773

- All samples were digested and analyzed within the recommended method holding time.
- .
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40329-1MS, D40329-1MSD, D40329-1SDL were used as the QC samples for the metals analysis.

## Metals By Method SW846 7471B

**Matrix** SO

**Batch ID:** MP8794

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40329-1MS, D40329-1MSD were used as the QC samples for the metals analysis.

## Wet Chemistry By Method ASTM D1498-76M

**Matrix** SO

**Batch ID:** GN17476

- Sample(s) D40350-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

### Wet Chemistry By Method SM19 2540B M

<b>Matrix</b> SO	<b>Batch ID:</b> GN17451
------------------	--------------------------

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

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

<b>Matrix</b> SO	<b>Batch ID:</b> R15016
------------------	-------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- D40328-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

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

<b>Matrix</b> SO	<b>Batch ID:</b> GP8586
------------------	-------------------------

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40427-1DUP, D40427-1MS, D40427-1MSD were used as the QC samples for the Chromium, Hexavalent analysis.

### Wet Chemistry By Method SW846 9045D

<b>Matrix</b> SO	<b>Batch ID:</b> GN17446
------------------	--------------------------

- The following samples were run outside of holding time for method SW846 9045D: D40328-1

### Wet Chemistry By Method USDA HANDBOOK 60

<b>Matrix</b> SO	<b>Batch ID:</b> MP8775
------------------	-------------------------

- D40328-1A 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

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**Job Number:** D40328  
**Account:** XTO Energy  
**Project:** PCU 296-5A  
**Collected:** 10/25/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### D40328-1 FW SUBLINER COMP

Arsenic	4.1	0.13		mg/kg	SW846 6020A
Barium	488	1.3		mg/kg	SW846 6010C
Chromium	20.3	1.3		mg/kg	SW846 6010C
Copper	12.0	1.3		mg/kg	SW846 6010C
Lead	10.9	6.6		mg/kg	SW846 6010C
Nickel	15.2	4.0		mg/kg	SW846 6010C
Zinc	33.7	4.0		mg/kg	SW846 6010C
Specific Conductivity	228	1.0		umhos/cm	SM2510B-1997 MOD
Chromium, Trivalent <sup>a</sup>	20.3	2.3		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2	360			mv	ASTM D1498-76M
pH	9.50			su	SW846 9045D

### D40328-1A FW SUBLINER COMP

Calcium	15.2	2.0		mg/l	SW846 6010C
Magnesium	3.95	1.0		mg/l	SW846 6010C
Sodium	32.1	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>	1.90			ratio	USDA HANDBOOK 60

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

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



Sample Results

Report of Analysis

Accutest Laboratories

## Report of Analysis

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<b>Client Sample ID:</b>	FW SUBLINER COMP	<b>Date Sampled:</b>	10/25/12
<b>Lab Sample ID:</b>	D40328-1	<b>Date Received:</b>	10/27/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.8
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	PCU 296-5A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V24392.D	1	10/29/12	BD	n/a	n/a	V5V1486
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.05 g	5.0 ml	100 ul
Run #2			

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.076	0.038	mg/kg	
108-88-3	Toluene	ND	0.15	0.076	mg/kg	
100-41-4	Ethylbenzene	ND	0.15	0.029	mg/kg	
1330-20-7	Xylene (total)	ND	0.31	0.15	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	91%		64-130%
460-00-4	4-Bromofluorobenzene	100%		62-131%
17060-07-0	1,2-Dichloroethane-D4	103%		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

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## Report of Analysis

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<b>Client Sample ID:</b>	FW SUBLINER COMP	
<b>Lab Sample ID:</b>	D40328-1	<b>Date Sampled:</b> 10/25/12
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b> 10/27/12
<b>Method:</b>	SW846 8270C BY SIM SW846 3546	<b>Percent Solids:</b> 78.8
<b>Project:</b>	PCU 296-5A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	3G11850.D	1	10/31/12	DC	10/30/12	OP6884	E3G558
Run #2							

	Initial Weight	Final Volume
Run #1	5.36 g	1.0 ml
Run #2		

## COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.059	0.031	mg/kg	
120-12-7	Anthracene	ND	0.059	0.031	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.059	0.031	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.059	0.031	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.059	0.031	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.059	0.031	mg/kg	
218-01-9	Chrysene	ND	0.059	0.031	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.059	0.031	mg/kg	
206-44-0	Fluoranthene	ND	0.059	0.031	mg/kg	
86-73-7	Fluorene	ND	0.059	0.031	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.059	0.031	mg/kg	
91-20-3	Naphthalene	ND	0.083	0.073	mg/kg	
129-00-0	Pyrene	ND	0.059	0.031	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	75%		10-159%
321-60-8	2-Fluorobiphenyl	70%		19-131%
1718-51-0	Terphenyl-d14	86%		18-150%

(a) Elevated reporting limits due to matrix interference, dilution required during sample prep.

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

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## Report of Analysis

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<b>Client Sample ID:</b>	FW SUBLINER COMP			<b>Date Sampled:</b>	10/25/12
<b>Lab Sample ID:</b>	D40328-1			<b>Date Received:</b>	10/27/12
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	78.8
<b>Method:</b>	SW846 8015B				
<b>Project:</b>	PCU 296-5A				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB18265.D	1	10/29/12	SK	n/a	n/a	GGB998
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	15	7.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	97%		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

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## Report of Analysis

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<b>Client Sample ID:</b>	FW SUBLINER COMP		<b>Date Sampled:</b>	10/25/12
<b>Lab Sample ID:</b>	D40328-1		<b>Date Received:</b>	10/27/12
<b>Matrix:</b>	SO - Soil		<b>Percent Solids:</b>	78.8
<b>Method:</b>	SW846-8015B SW846 3546			
<b>Project:</b>	PCU 296-5A			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD19027.D	1	10/30/12	AV	10/29/12	OP6873	GFD960
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	17	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	80%		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

**Client Sample ID:** FW SUBLINER COMP**Lab Sample ID:** D40328-1**Matrix:** SO - Soil**Project:** PCU 296-5A**Date Sampled:** 10/25/12**Date Received:** 10/27/12**Percent Solids:** 78.8**Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4.1	0.13	mg/kg	5	10/30/12	11/03/12 JB	SW846 6020A <sup>3</sup>	SW846 3050B <sup>5</sup>
Barium	488	1.3	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Cadmium	< 1.3	1.3	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Chromium	20.3	1.3	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Copper	12.0	1.3	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Lead	10.9	6.6	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Mercury	< 0.098	0.098	mg/kg	1	11/01/12	11/01/12 JM	SW846 7471B <sup>2</sup>	SW846 7471B <sup>6</sup>
Nickel	15.2	4.0	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Selenium	< 6.6	6.6	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Silver	< 4.0	4.0	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Zinc	33.7	4.0	mg/kg	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA2949

(2) Instrument QC Batch: MA2954

(3) Instrument QC Batch: MA2961

(4) Prep QC Batch: MP8772

(5) Prep QC Batch: MP8773

(6) Prep QC Batch: MP8794

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	FW SUBLINER COMP	<b>Date Sampled:</b>	10/25/12
<b>Lab Sample ID:</b>	D40328-1	<b>Date Received:</b>	10/27/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.8
<b>Project:</b>	PCU 296-5A		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>prep: DEPT.OF AG, BOOK N9</b>							
Specific Conductivity	228	1.0	umhos/cm	1	10/31/12	JD	SM2510B-1997 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	11/02/12	KB	SW846 3060A/7196A
Chromium, Trivalent <sup>a</sup>	20.3	2.3	mg/kg	1	11/02/12	KB	SW846 3060/7196A M
Redox Potential Vs H2	360		mv	1	10/30/12	CT	ASTM D1498-76M
Solids, Percent	78.8		%	1	10/30/12	SWT	SM19 2540B M
pH	9.50		su	1	10/29/12 15:05	JD	SW846 9045D

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

RL = Reporting Limit

Report of Analysis

**Client Sample ID:** FW SUBLINER COMP  
**Lab Sample ID:** D40328-1A  
**Matrix:** SO - Soil  
**Project:** PCU 296-5A

**Date Sampled:** 10/25/12  
**Date Received:** 10/27/12  
**Percent Solids:** 78.8

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	15.2	2.0	mg/l	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	3.95	1.0	mg/l	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	32.1	2.0	mg/l	1	10/30/12	10/31/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

(1) Instrument QC Batch: MA2949  
(2) Prep QC Batch: MP8775

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	FW SUBLINER COMP	<b>Date Sampled:</b>	10/25/12
<b>Lab Sample ID:</b>	D40328-1A	<b>Date Received:</b>	10/27/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.8
<b>Project:</b>	PCU 296-5A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	1.90		ratio	1	10/31/12 21:11	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

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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

FED-EX Tracking #	Bottle Order Control #
Accutest Quote #	Accutest Job # <b>D40328</b>

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)												Matrix Codes	
Company Name <b>KRW Consulting</b>		Project Name <b>XTO PCU 296-SA</b>		<div>T-910</div>												<div>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 WIP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank</div>	
Street Address <b>8000 West 14th Street, Suite 200</b>		Street															
City <b>Lakewood, CO 80214</b>		City State															
Project Contact <b>Dwayne Knudson</b>		Project # <b>1210-04</b>															
Phone # <b>970-488-1098</b>		Client Purchase Order #															
Sampler(s) Name(s) <b>DWAYNE KNUDSON</b> 970-488-1098		Project Manager <b>Joe Hess</b>		Billing Information (if different from Report to)		Company Name <b>XTO Energy</b>		Street Address <b>21459 CR 5</b>		City <b>Rifle, CO 81650</b>		Attention: <b>Jessica Dooling</b>		LAB USE ONLY			
Field ID / Point of Collection <b>FW SUBLINER COMP</b>		MECH/DI Vial #		Collection Date <b>10-25-12</b> Time <b>1:00</b>		Sampled by <b>DK</b>		Matrix <b>SO</b>		# of bottles <b>5</b>		Number of preserved bottles ICD NICH HNO3 VOSO4 NONE DI Water MECH ENCODE Residuals		LAB USE ONLY			
Turnaround Time (Business days)		Approved By (Accutest PM): / Date:		Data Deliverable Information												Comments / Special Instructions	
<input type="checkbox"/> Std. 10 Business Days <input checked="" type="checkbox"/> Std. 5 Business Days (By contract only) <input type="checkbox"/> 3 Day Emergency <input type="checkbox"/> 2 Day Emergency <input type="checkbox"/> 1 Day Emergency <input type="checkbox"/> Emergency & Rush T/A data available VIA Lablink		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> COMMBN <input type="checkbox"/> COMMBN+ <input type="checkbox"/> State Forms Required <input type="checkbox"/> Send Forms to State <input type="checkbox"/> Report by Fax <input checked="" type="checkbox"/> Report by PDF ONLY <input type="checkbox"/> EDD Format		Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial BN = Results/QC/Narrative (+ = chromatograms)												Please email to: <b>KRW Piceance Team</b>	
Relinquished by Sampler: <b>1 Dwayne Knudson</b>		Date Time: <b>10/26/12 1630</b>		Received By: <b>1 [Signature]</b>		Relinquished By: <b>2 [Signature]</b>		Date Time: <b>10/27 1045</b>		Received By: <b>2 [Signature]</b>		Date Time: <b>10/27 1045</b>		Received By: <b>4 [Signature]</b>		Date Time: <b>10/27 1045</b>	
Relinquished by Sampler: <b>3 [Signature]</b>		Date Time:		Received By: <b>3 Rifle Service Center</b>		Relinquished By:		Date Time:		Received By:		Date Time:		Received By:		Date Time:	
Relinquished by:		Date Time:		Received By:		Custody Seal # <b>FX</b>		<input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact		Preserved where applicable <input type="checkbox"/>		On Ice <input checked="" type="checkbox"/>		Cooler Temp. <b>2.5</b>			

D40328: Chain of Custody

Page 1 of 2

# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D40328

Client: KRW CONSULTING

Immediate Client Services Action Required: No

Date / Time Received: 10/27/2012 10:45:00 A

No. Coolers: 1

Client Service Action Required at Login: No

Project: XTO PCU 296-5A

Airbill #'s: FedEx

Cooler Security	Y	or	N		Y	or	N
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"/>

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

Quality Control Preservation	Y	or	N	N/A
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"/>

Sample Integrity - Documentation	Y	or	N
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"/>

Sample Integrity - Condition	Y	or	N
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

Sample Integrity - Instructions	Y	or	N	N/A
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:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1486-MB	5V24387.D	1	10/29/12	BD	n/a	n/a	V5V1486

The QC reported here applies to the following samples:

Method: SW846 8260B

D40328-1

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	90% 64-130%
460-00-4	4-Bromofluorobenzene	89% 62-131%
17060-07-0	1,2-Dichloroethane-D4	100% 70-130%

## Blank Spike Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1486-BS	5V24388.D	1	10/29/12	BD	n/a	n/a	V5V1486

The QC reported here applies to the following samples:

Method: SW846 8260B

D40328-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	44.5	89	70-130
100-41-4	Ethylbenzene	50	44.4	89	70-130
108-88-3	Toluene	50	42.3	85	70-130
1330-20-7	Xylene (total)	150	141	94	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	92%	64-130%
460-00-4	4-Bromofluorobenzene	100%	62-131%
17060-07-0	1,2-Dichloroethane-D4	97%	70-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D40126-1MS	5V24390.D	1	10/29/12	BD	n/a	n/a	V5V1486
D40126-1MSD	5V24391.D	1	10/29/12	BD	n/a	n/a	V5V1486
D40126-1	5V24389.D	1	10/29/12	BD	n/a	n/a	V5V1486

The QC reported here applies to the following samples:

Method: SW846 8260B

D40328-1

CAS No.	Compound	D40126-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		3430	3600	105	3650	106	1	64-139/30
100-41-4	Ethylbenzene	ND		3430	3470	101	3540	103	2	68-136/30
108-88-3	Toluene	ND		3430	3220	94	3400	99	5	60-130/30
1330-20-7	Xylene (total)	ND		10300	11100	108	11200	109	1	58-142/30

CAS No.	Surrogate Recoveries	MS	MSD	D40126-1	Limits
2037-26-5	Toluene-D8	88%	90%	89%	64-130%
460-00-4	4-Bromofluorobenzene	112%	110%	101%	62-131%
17060-07-0	1,2-Dichloroethane-D4	100%	94%	99%	70-130%

\* = Outside of Control Limits.



GC/MS Volatiles

Raw Data

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5102912.S\  
Data File : 5V24392.D  
Acq On : 29 Oct 2012 2:05 pm  
Operator : BRETD  
Sample : D40328-1  
Misc : MS4875,V5V1486,5.050,,100,5,1  
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 30 14:41:15 2012  
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M  
Quant Title : 8260  
QLast Update : Fri Sep 07 10:53:51 2012  
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.647	168	140830	50.00	ug/l	0.00
35) 1,4-Difluorobenzene	12.446	114	192923	50.00	ug/l	0.00
53) Chlorobenzene-d5	15.095	117	209227	50.00	ug/l	0.00
74) 1,4-Dichlorobenzene-d4	17.070	152	158480	50.00	ug/l	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4	12.024	102	13951	51.65	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	103.30%
61) Toluene-d8	13.850	98	224806	45.30	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	90.60%
69) 4-Bromofluorobenzene	16.042	95	113122	50.05	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	100.10%

Target Compounds

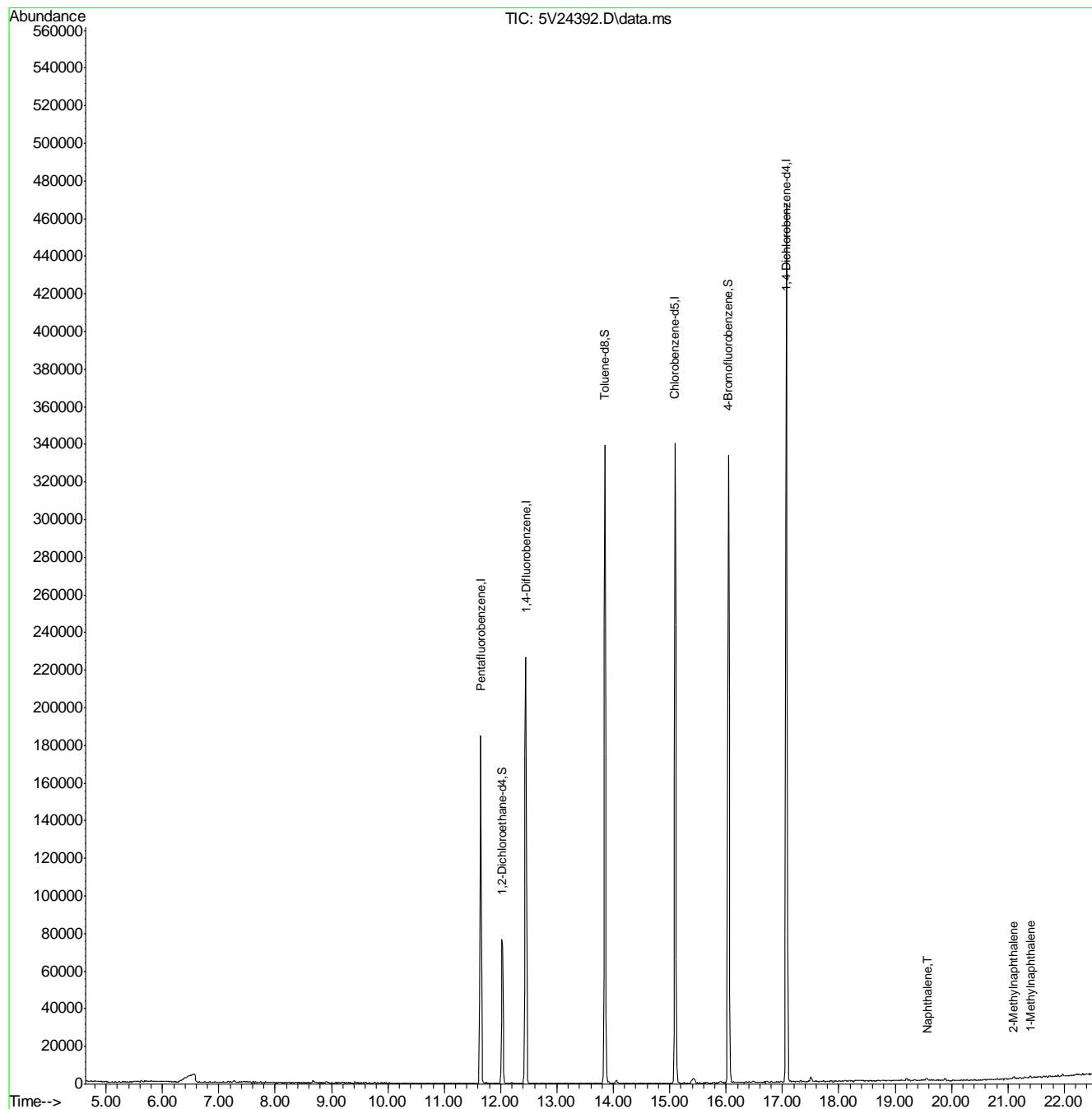
						Qvalue
91) Naphthalene	19.570	128	2436	0.27	ug/l	100
94) 2-Methylnaphthalene	21.100	142	954	1.10	ug/l #	74
95) 1-Methylnaphthalene	21.397	142	486	0.71	ug/l #	82

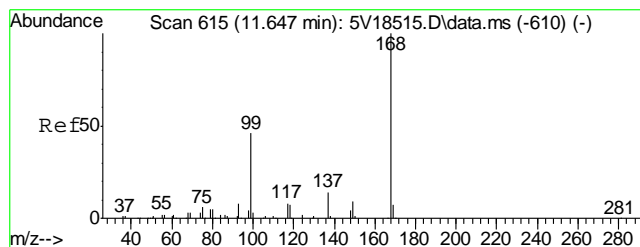
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5102912.S\  
Data File : 5V24392.D  
Acq On : 29 Oct 2012 2:05 pm  
Operator : BRETD  
Sample : D40328-1  
Misc : MS4875,V5V1486,5.050,,100,5,1  
ALS Vial : 8 Sample Multiplier: 1

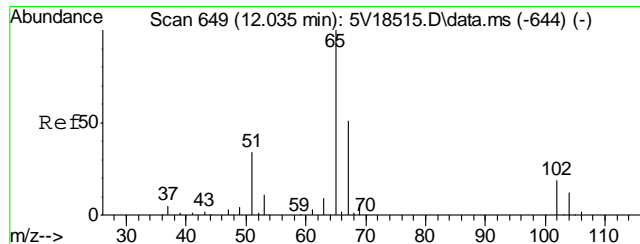
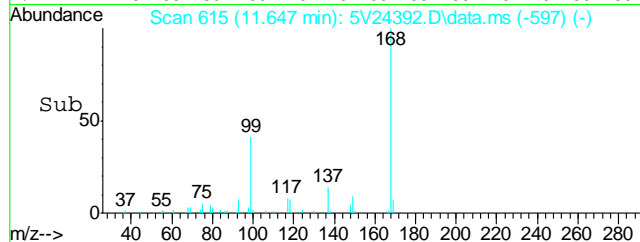
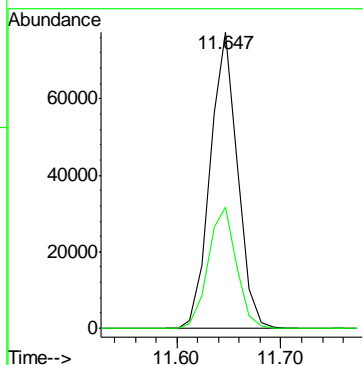
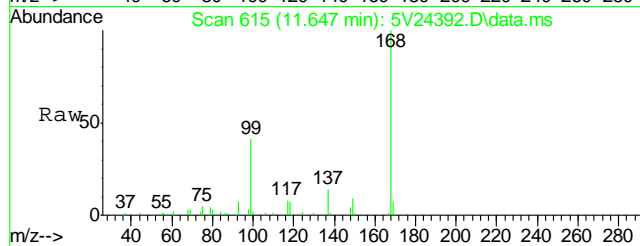
Quant Time: Oct 30 14:41:15 2012  
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M  
Quant Title : 8260  
QLast Update : Fri Sep 07 10:53:51 2012  
Response via : Initial Calibration





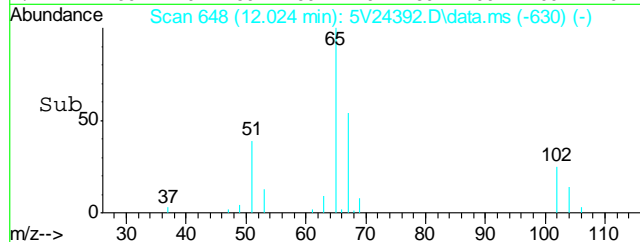
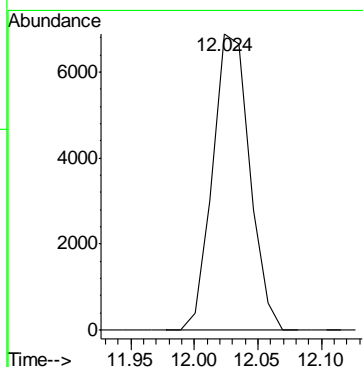
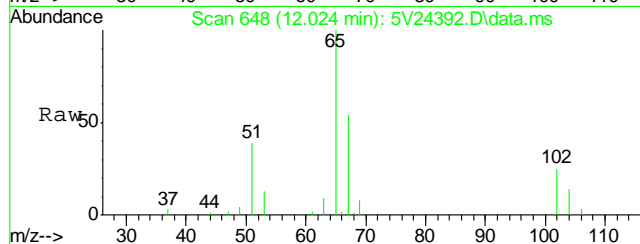
#2  
Pentafluorobenzene  
Concen: 50.00 ug/l  
RT: 11.647 min Scan# 615  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

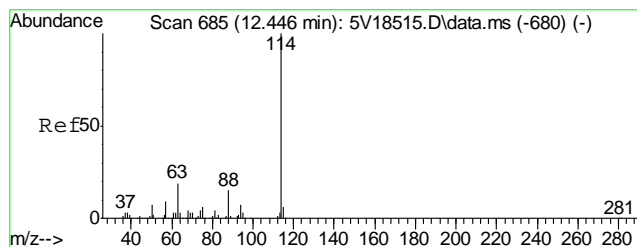
Tgt Ion:168 Resp: 140830  
Ion Ratio Lower Upper  
168 100  
99 42.2 37.4 56.2



#33  
1,2-Dichloroethane-d4  
Concen: 51.65 ug/l  
RT: 12.024 min Scan# 648  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

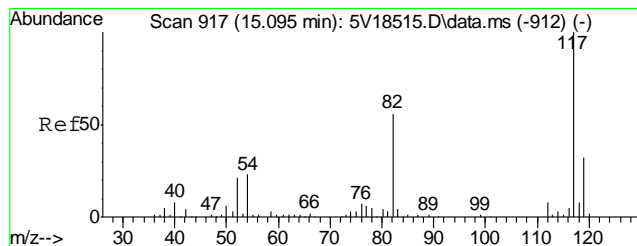
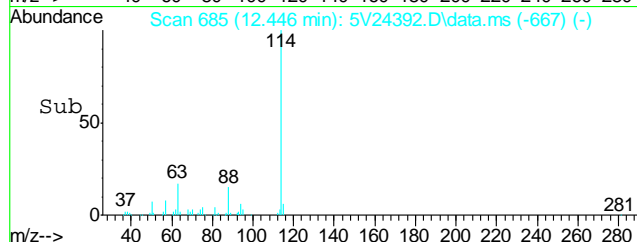
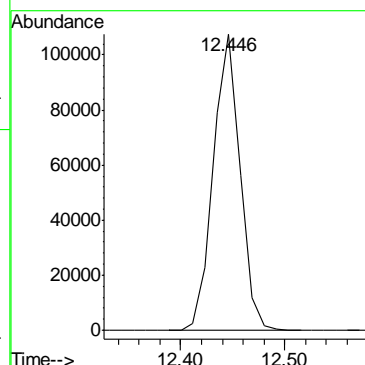
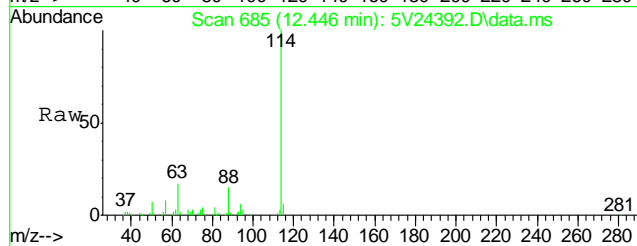
Tgt Ion:102 Resp: 13951





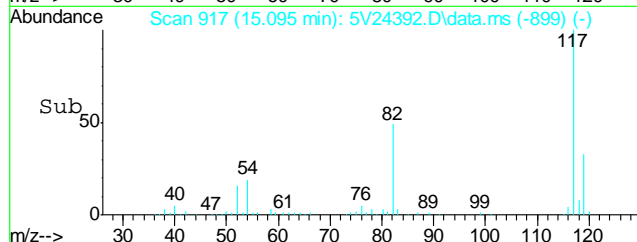
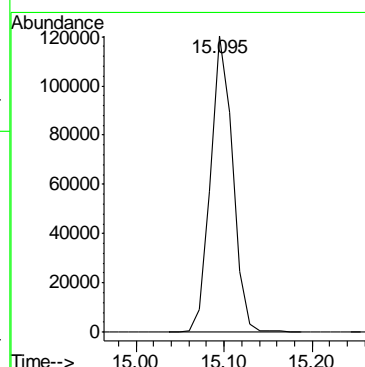
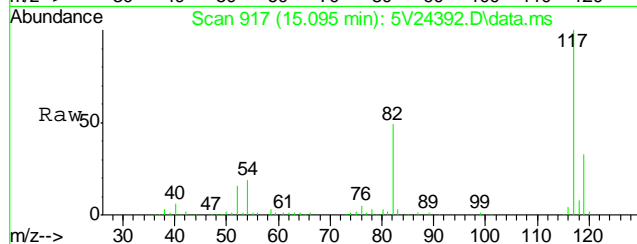
#35  
1,4-Difluorobenzene  
Concen: 50.00 ug/l  
RT: 12.446 min Scan# 685  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

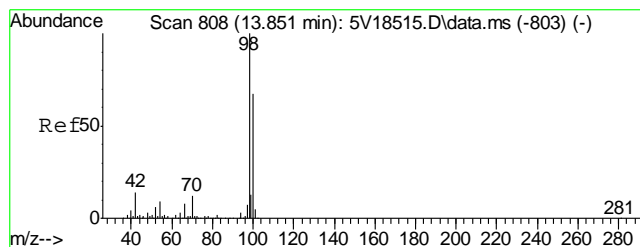
Tgt Ion:114 Resp: 192923



#53  
Chlorobenzene-d5  
Concen: 50.00 ug/l  
RT: 15.095 min Scan# 917  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

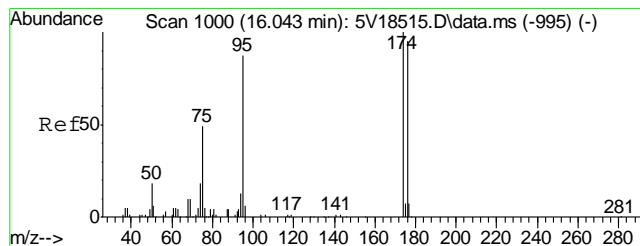
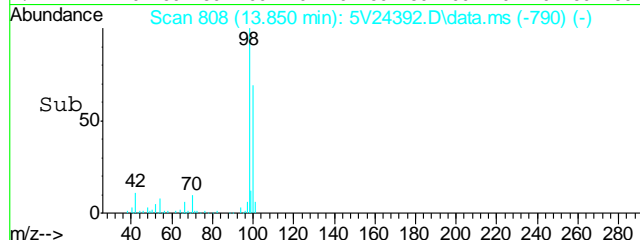
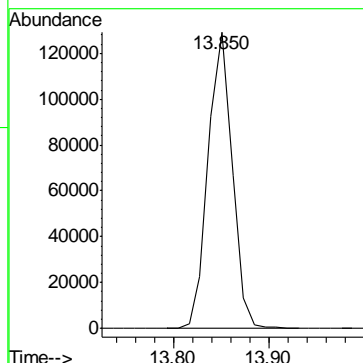
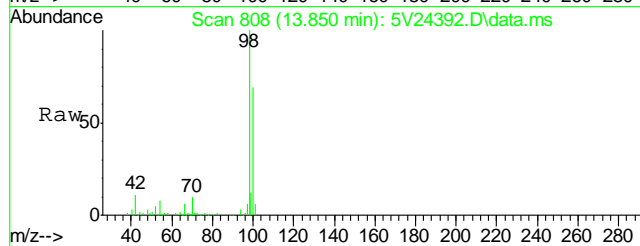
Tgt Ion:117 Resp: 209227





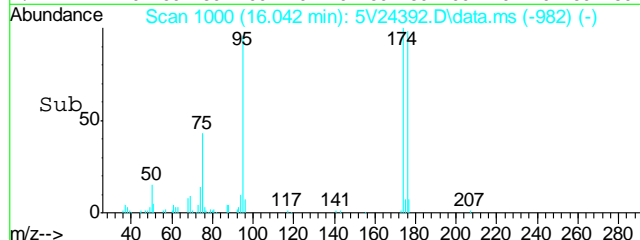
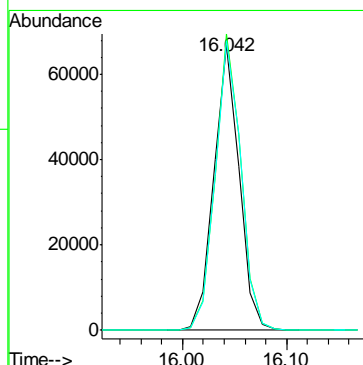
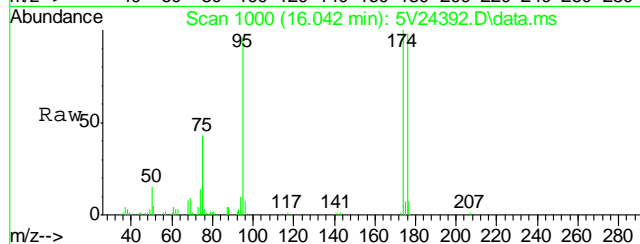
#61  
Toluene-d8  
Concen: 45.30 ug/l  
RT: 13.850 min Scan# 808  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

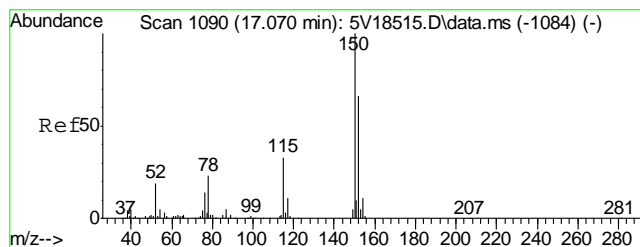
Tgt Ion: 98 Resp: 224806



#69  
4-Bromofluorobenzene  
Concen: 50.05 ug/l  
RT: 16.042 min Scan# 1000  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

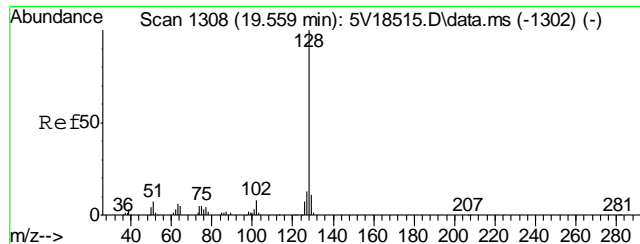
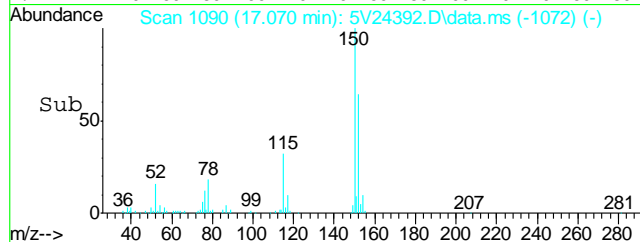
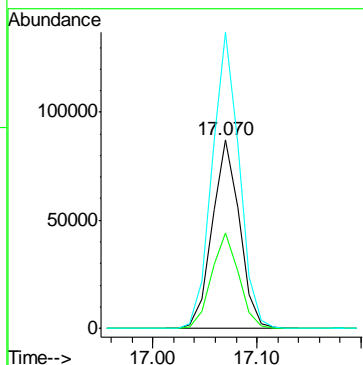
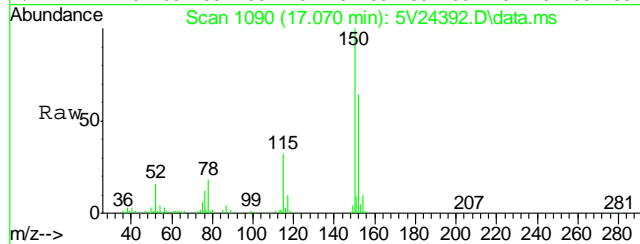
Tgt Ion: 95 Resp: 113122  
Ion Ratio Lower Upper  
95 100  
174 104.7 77.1 117.1  
176 103.5 73.4 113.4





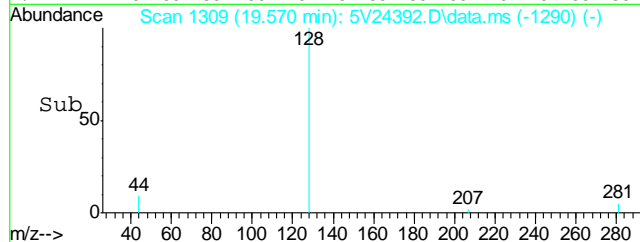
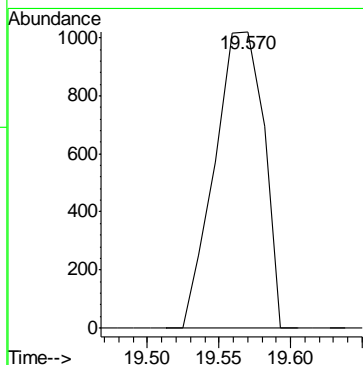
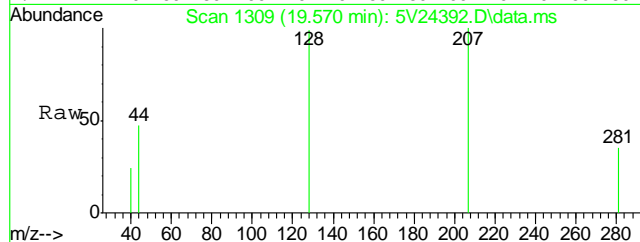
#74  
 1,4-Dichlorobenzene-d4  
 Concen: 50.00 ug/l  
 RT: 17.070 min Scan# 1090  
 Delta R.T. 0.000 min  
 Lab File: 5V24392.D  
 Acq: 29 Oct 2012 2:05 pm

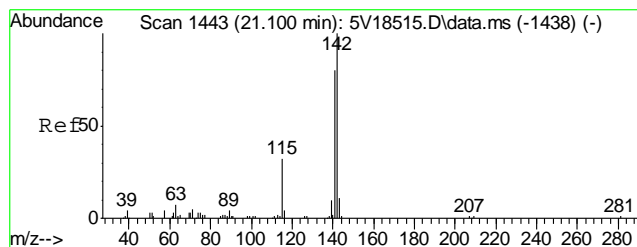
Tgt Ion	Ratio	Lower	Upper
152	100		
115	50.3	41.4	62.0
150	156.5	153.9	230.9



#91  
 Naphthalene  
 Concen: 0.27 ug/l  
 RT: 19.570 min Scan# 1309  
 Delta R.T. 0.011 min  
 Lab File: 5V24392.D  
 Acq: 29 Oct 2012 2:05 pm

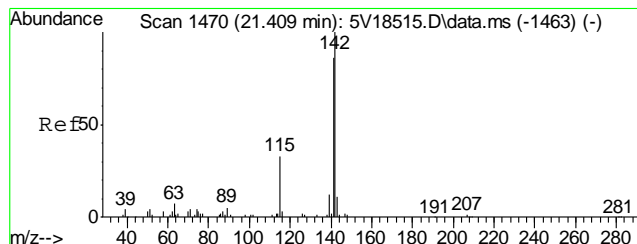
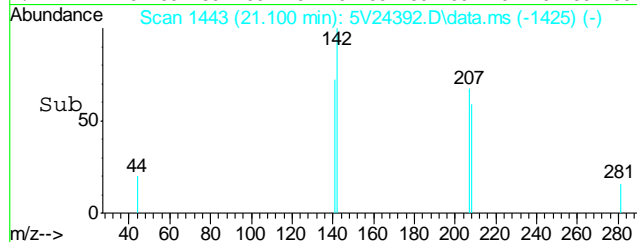
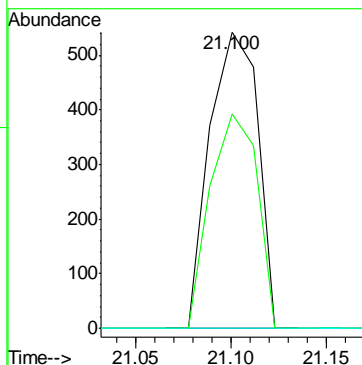
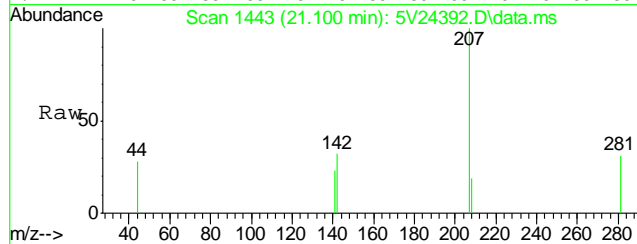
Tgt Ion: 128 Resp: 2436





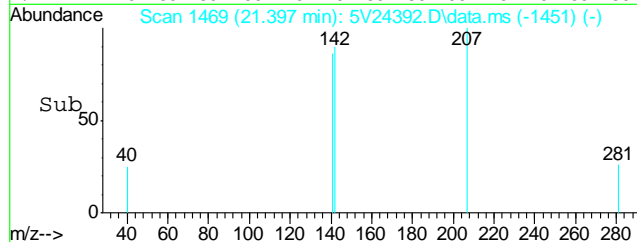
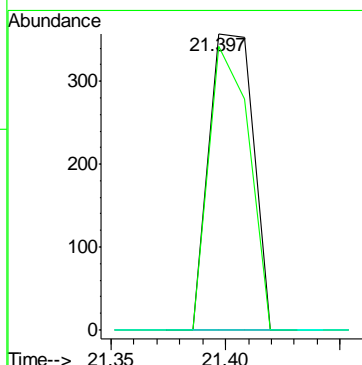
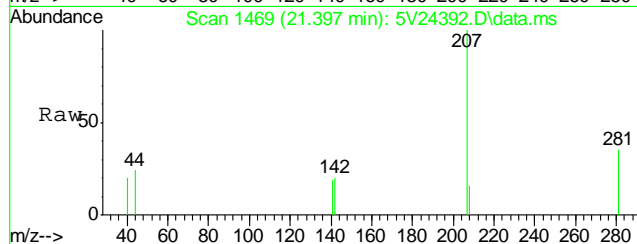
#94  
2-Methylnaphthalene  
Concen: 1.10 ug/l  
RT: 21.100 min Scan# 1443  
Delta R.T. 0.000 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

Tgt Ion	Ratio	Lower	Upper
142	100		
141	71.0	66.2	99.4
115	0.0	25.9	38.9#



#95  
1-Methylnaphthalene  
Concen: 0.71 ug/l  
RT: 21.397 min Scan# 1469  
Delta R.T. 0.001 min  
Lab File: 5V24392.D  
Acq: 29 Oct 2012 2:05 pm

Tgt Ion	Ratio	Lower	Upper
142	100		
141	87.4	68.9	103.3
115	0.0	27.3	40.9#





## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5102912.S\  
Data File : 5V24387.D  
Acq On : 29 Oct 2012 11:19 am  
Operator : BRETD  
Sample : MB  
Misc : MS4875,V5V1486,5.00,,100,5,1  
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 30 14:37:24 2012  
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M  
Quant Title : 8260  
QLast Update : Fri Sep 07 10:53:51 2012  
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.647	168	115918	50.00	ug/l	0.00
35) 1,4-Difluorobenzene	12.446	114	158718	50.00	ug/l	0.00
53) Chlorobenzene-d5	15.095	117	173604	50.00	ug/l	0.00
74) 1,4-Dichlorobenzene-d4	17.070	152	124262	50.00	ug/l	0.00

## System Monitoring Compounds

33) 1,2-Dichloroethane-d4	12.024	102	11164	50.21	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	100.42%
61) Toluene-d8	13.850	98	185097	44.95	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	89.90%
69) 4-Bromofluorobenzene	16.042	95	83385	44.47	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	88.94%

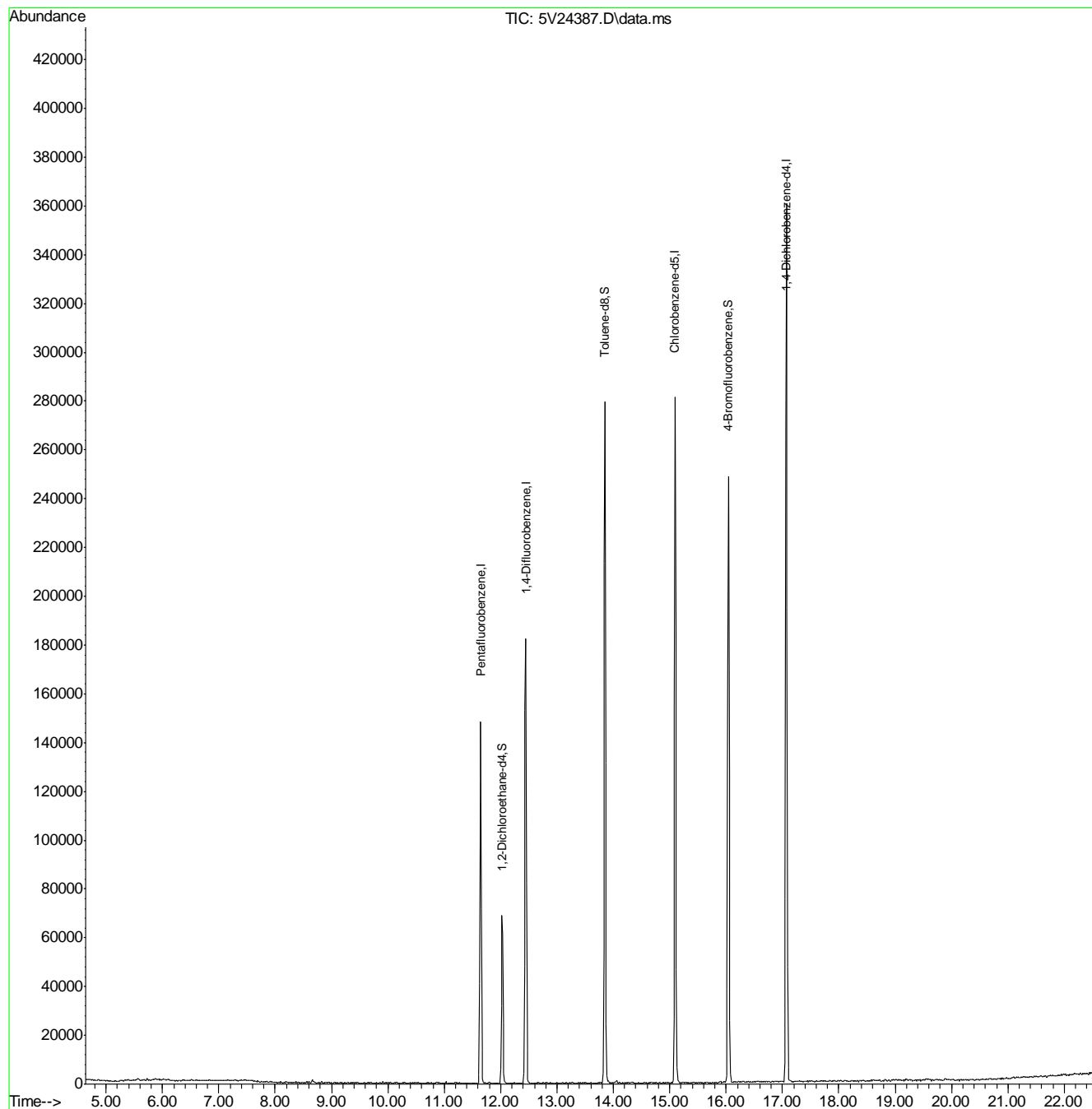
Target Compounds	Qvalue
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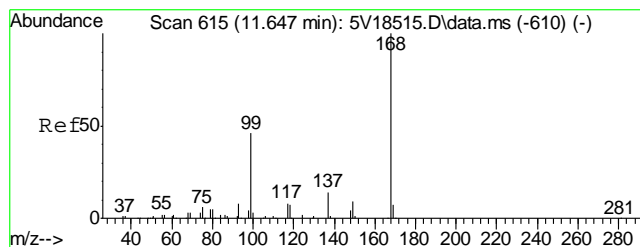
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5102912.S\  
Data File : 5V24387.D  
Acq On : 29 Oct 2012 11:19 am  
Operator : BRETD  
Sample : MB  
Misc : MS4875,V5V1486,5.00,,100,5,1  
ALS Vial : 3 Sample Multiplier: 1

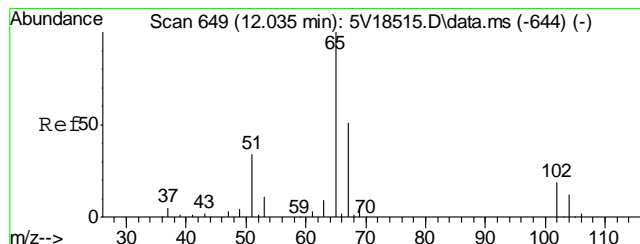
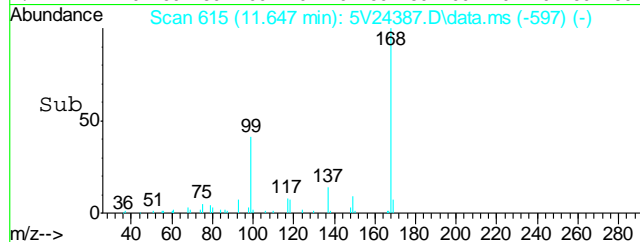
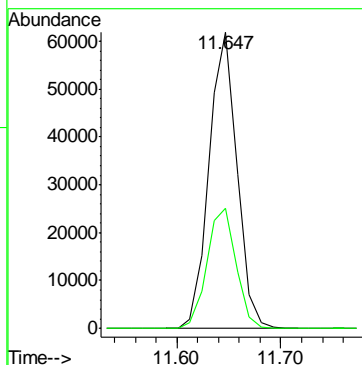
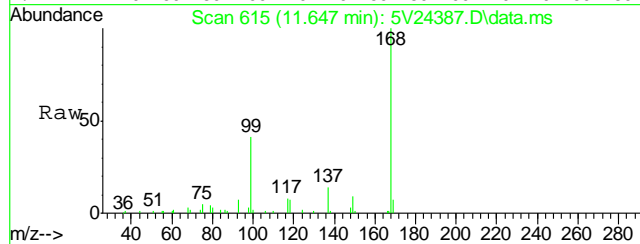
Quant Time: Oct 30 14:37:24 2012  
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M  
Quant Title : 8260  
QLast Update : Fri Sep 07 10:53:51 2012  
Response via : Initial Calibration





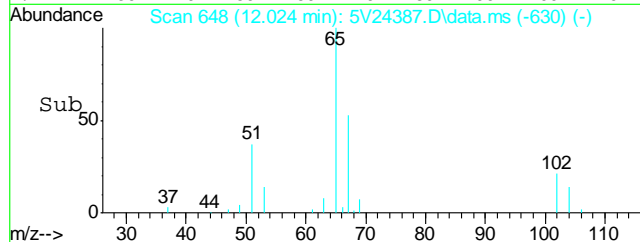
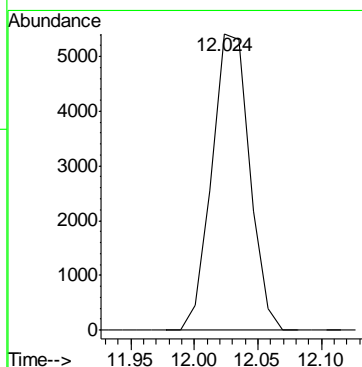
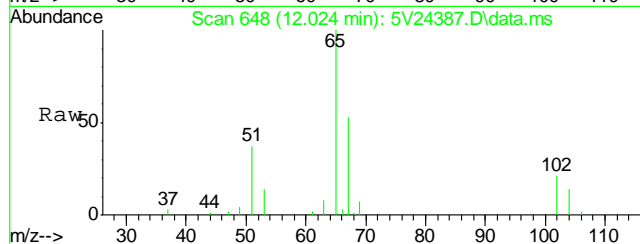
#2  
Pentafluorobenzene  
Concen: 50.00 ug/l  
RT: 11.647 min Scan# 615  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

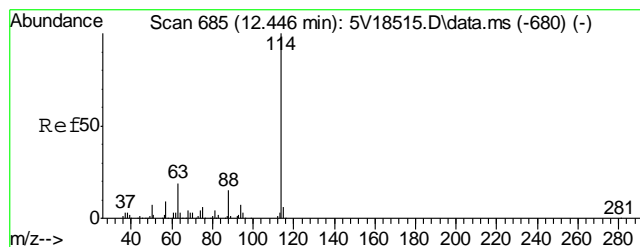
Tgt Ion:168 Resp: 115918  
Ion Ratio Lower Upper  
168 100  
99 42.1 37.4 56.2



#33  
1,2-Dichloroethane-d4  
Concen: 50.21 ug/l  
RT: 12.024 min Scan# 648  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

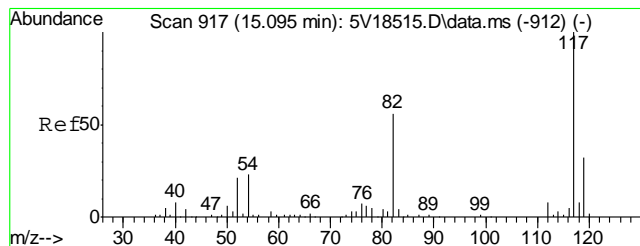
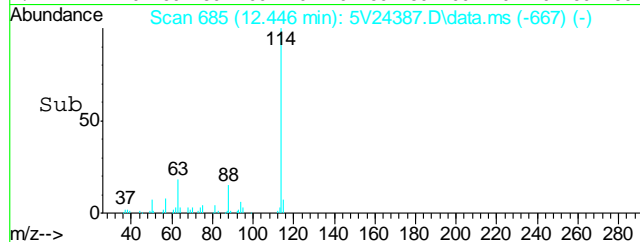
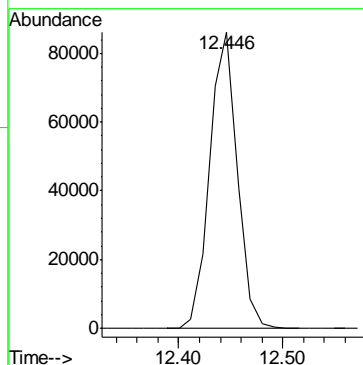
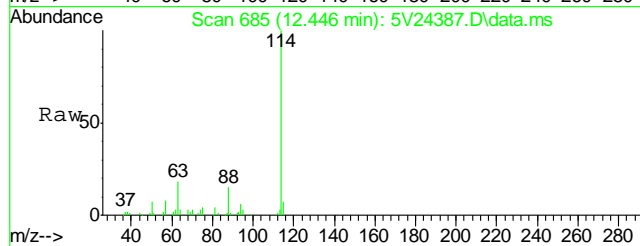
Tgt Ion:102 Resp: 11164





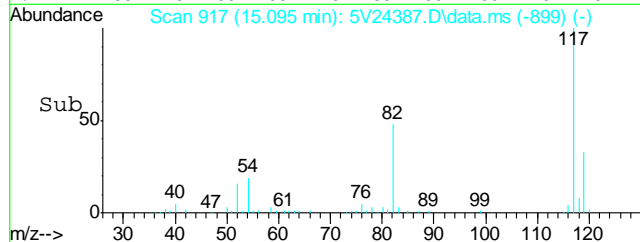
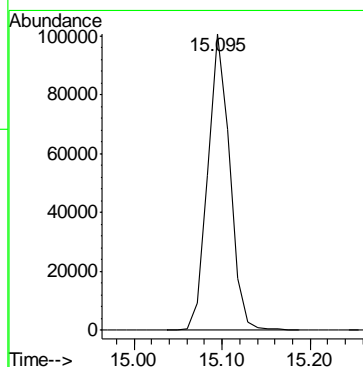
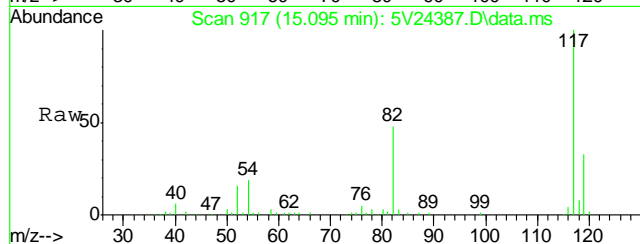
#35  
1,4-Difluorobenzene  
Concen: 50.00 ug/l  
RT: 12.446 min Scan# 685  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

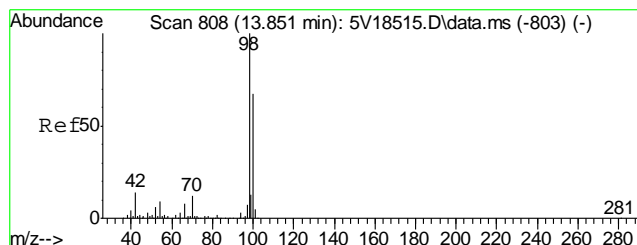
Tgt Ion:114 Resp: 158718



#53  
Chlorobenzene-d5  
Concen: 50.00 ug/l  
RT: 15.095 min Scan# 917  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

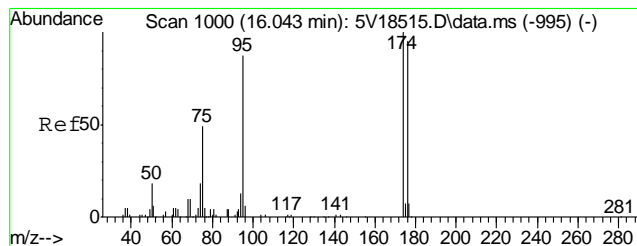
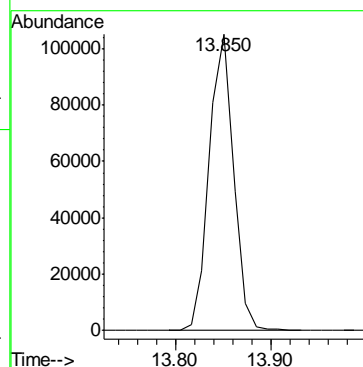
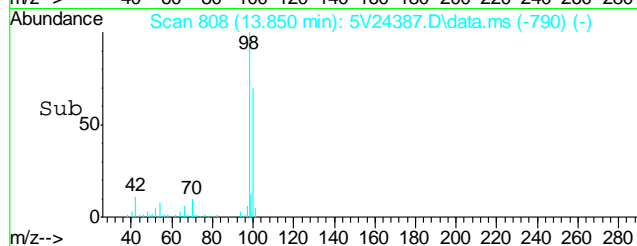
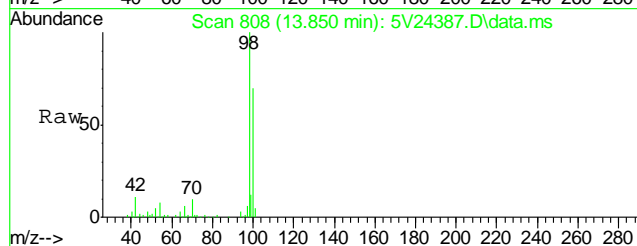
Tgt Ion:117 Resp: 173604





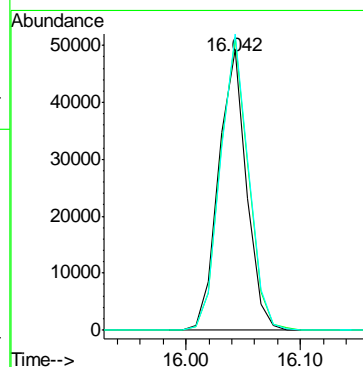
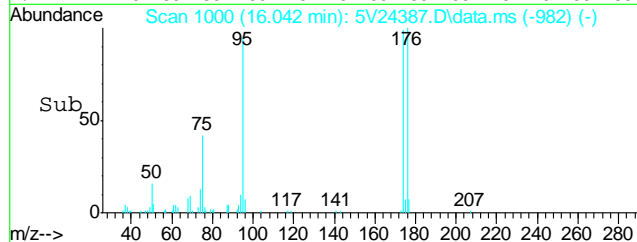
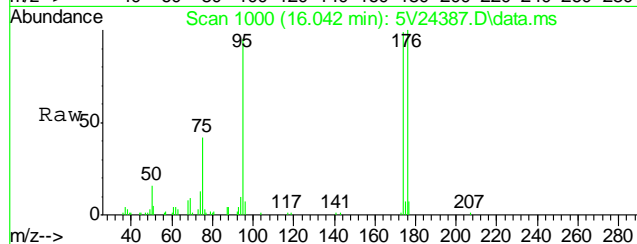
#61  
Toluene-d8  
Concen: 44.95 ug/l  
RT: 13.850 min Scan# 808  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

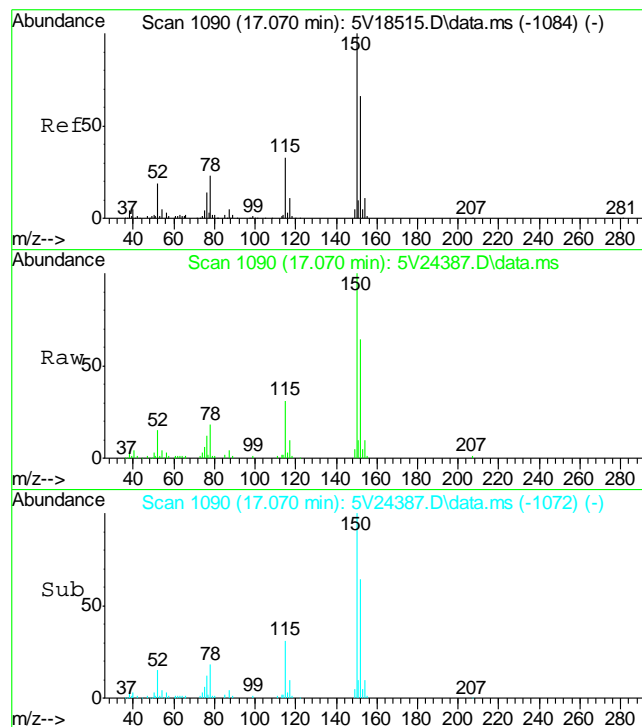
Tgt Ion: 98 Resp: 185097



#69  
4-Bromofluorobenzene  
Concen: 44.47 ug/l  
RT: 16.042 min Scan# 1000  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

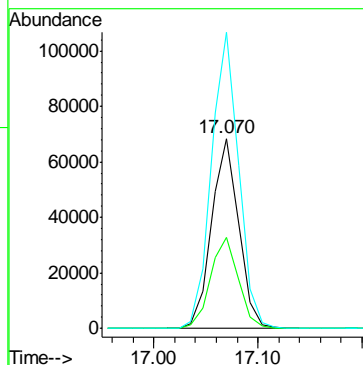
Tgt Ion: 95 Resp: 83385  
Ion Ratio Lower Upper  
95 100  
174 105.7 77.1 117.1  
176 106.3 73.4 113.4





#74  
1,4-Dichlorobenzene-d4  
Concen: 50.00 ug/l  
RT: 17.070 min Scan# 1090  
Delta R.T. 0.000 min  
Lab File: 5V24387.D  
Acq: 29 Oct 2012 11:19 am

Tgt Ion	Ratio	Lower	Upper
152	100		
115	48.9	41.4	62.0
150	156.4	153.9	230.9



## GC/MS Semi-volatiles

### QC Data Summaries

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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:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6884-MB	3G11847.D	1	10/31/12	DC	10/30/12	OP6884	E3G558

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

D40328-1

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	74% 10-159%
321-60-8	2-Fluorobiphenyl	72% 19-131%
1718-51-0	Terphenyl-d14	87% 18-150%

8.1.1

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## Blank Spike Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6884-BS	3G11848.D	1	10/31/12	DC	10/30/12	OP6884	E3G558

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D40328-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	66.0	79	68-130
120-12-7	Anthracene	83.3	71.5	86	67-130
56-55-3	Benzo(a)anthracene	83.3	74.2	89	65-130
50-32-8	Benzo(a)pyrene	83.3	80.1	96	62-130
205-99-2	Benzo(b)fluoranthene	83.3	89.2	107	44-130
207-08-9	Benzo(k)fluoranthene	83.3	73.8	89	56-131
218-01-9	Chrysene	83.3	80.3	96	70-130
53-70-3	Dibenzo(a,h)anthracene	83.3	78.7	94	55-130
206-44-0	Fluoranthene	83.3	72.4	87	70-130
86-73-7	Fluorene	83.3	67.2	81	70-130
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	80.0	96	56-130
91-20-3	Naphthalene	83.3	64.4	77	70-130
129-00-0	Pyrene	83.3	74.7	90	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	73%	10-159%
321-60-8	2-Fluorobiphenyl	61%	19-131%
1718-51-0	Terphenyl-d14	82%	18-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6884-MS	3G11859.D	1	10/31/12	DC	10/30/12	OP6884	E3G558
OP6884-MSD	3G11860.D	1	10/31/12	DC	10/30/12	OP6884	E3G558
D40329-1	3G11858.D	1	10/31/12	DC	10/30/12	OP6884	E3G558

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D40328-1

CAS No.	Compound	D40329-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		98.8	65.4	66	75.1	76	3	25-151/30
120-12-7	Anthracene	ND		98.8	72.0	73	81.5	82	1	39-159/30
56-55-3	Benzo(a)anthracene	27.6		98.8	84.6	58	94.8	68	2	39-168/30
50-32-8	Benzo(a)pyrene	28.6		98.8	75.0	47	85.6	58	3	32-144/30
205-99-2	Benzo(b)fluoranthene	ND		98.8	88.4	89	102	103	19	24-163/30
207-08-9	Benzo(k)fluoranthene	ND		98.8	80.3	81	91.3	92	13	10-188/30
218-01-9	Chrysene	85.7		98.8	127	42* a	146	61	14	43-150/30
53-70-3	Dibenzo(a,h)anthracene	11.2		98.8	60.9	50	69.1	59	13	21-152/30
206-44-0	Fluoranthene	36.2		98.8	82.0	46	88.5	53	8	36-157/30
86-73-7	Fluorene	115		98.8	150	35	171	57	13	10-182/30
193-39-5	Indeno(1,2,3-cd)pyrene	13.0		98.8	55.1	43	64.7	52	16	20-154/30
91-20-3	Naphthalene	405		98.8	415	10	517	113	22	10-163/30
129-00-0	Pyrene	59.1		98.8	126	68	143	85	13	25-180/30

CAS No.	Surrogate Recoveries	MS	MSD	D40329-1	Limits
4165-60-0	Nitrobenzene-d5	5% * a	22%	9% * b	10-159%
321-60-8	2-Fluorobiphenyl	49%	56%	57%	19-131%
1718-51-0	Terphenyl-d14	63%	72%	67%	18-150%

(a) Outside control limits due to matrix interference.

(b) Outside control limits due to matrix interference. Confirmed by MS.

\* = Outside of Control Limits.

GC/MS Semi-volatiles

Raw Data

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## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\103112\  
 Data File : 3g11850.D  
 Acq On : 31 Oct 2012 7:02 pm  
 Operator : DONC  
 Sample : D40328-1  
 Misc : OP6884,E3G558,5.36,,,1,1  
 ALS Vial : 21 Sample Multiplier: 1

Quant Time: Nov 02 09:51:01 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G558.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Wed Oct 31 14:49:52 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.789	136	194169	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.507	164	111167	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.995	188	184086	4.0000	ug/mL	0.00
19) Chrysene-d12	11.630	240	138939	4.0000	ug/mL	0.00
24) Perylene-d12	13.035	264	97219	4.0000	ug/mL	0.00

## System Monitoring Compounds

2) Nitrobenzene-d5	5.103	82	898687	37.4339	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	74.86%		
7) 2-Fluorobiphenyl	6.846	172	1607415	34.8265	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	69.66%		
21) Terphenyl-d14	10.578	244	851233	43.0793	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	86.16%		

## Target Compounds

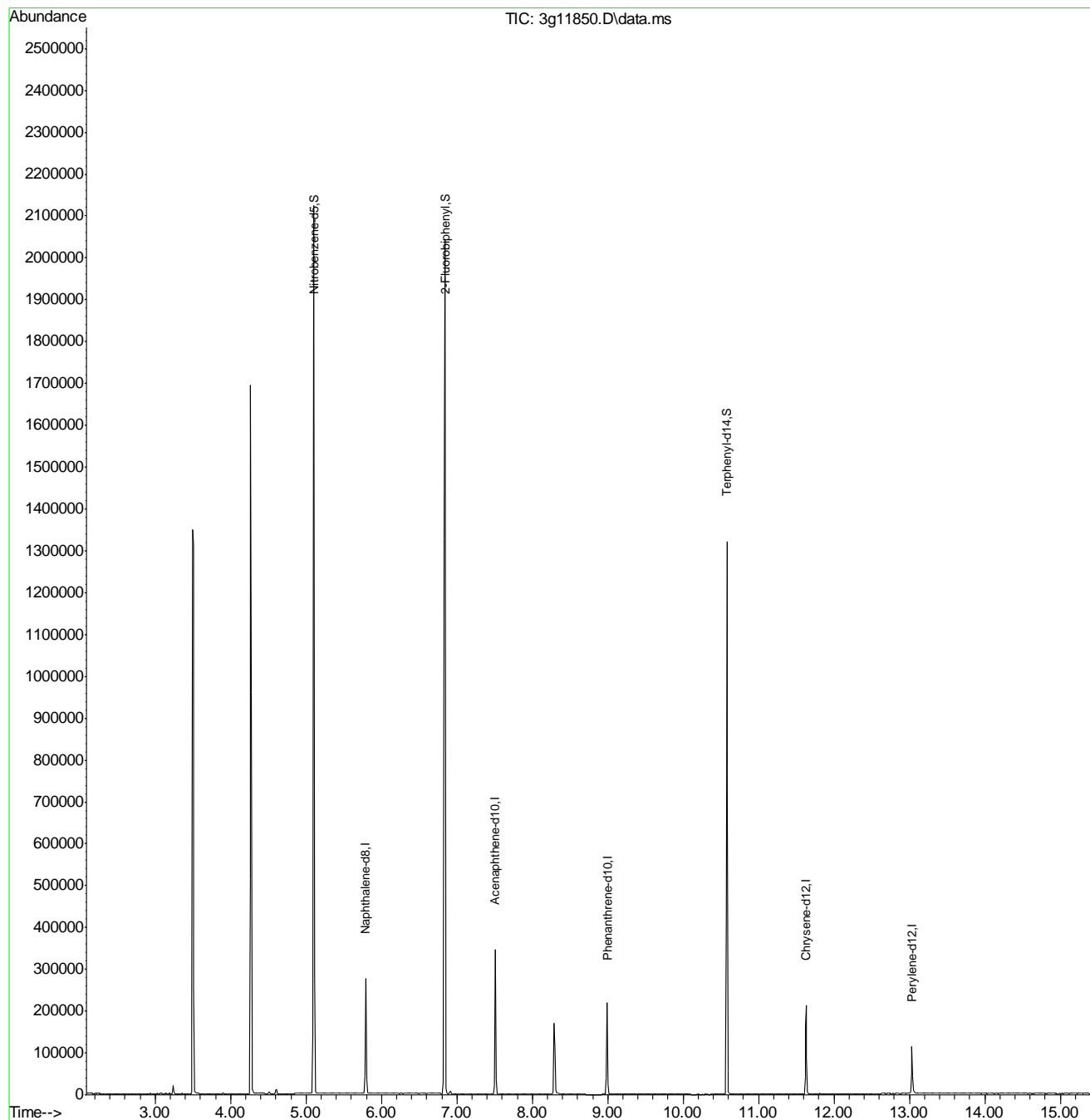
					Qvalue
3) N-Nitrosodimethylamine	2.501	74	19	N.D.	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d
5) Naphthalene	5.814	128	724	N.D.	
8) 2-Methylnaphthalene	6.487	142	319	N.D.	
9) 1-Methylnaphthalene	6.574	142	253	N.D.	
10) Acenaphthylene	7.366	152	172	N.D.	
11) Acenaphthene	7.507	154	571	N.D.	
12) Dibenzofuran	7.720	168	189	N.D.	
13) Fluorene	0.000	166	0	N.D.	d
14) Diphenylamine	0.000	169	0	N.D.	d
16) Phenanthrene	9.011	178	705	N.D.	
17) Anthracene	9.067	178	312	N.D.	
18) Fluoranthene	10.198	202	366	N.D.	
20) Pyrene	10.428	202	320	N.D.	
22) Benzo(a)anthracene	11.623	228	906	N.D.	
23) Chrysene	11.623	228	906	N.D.	
25) Benzo(b)fluoranthene	12.667	252	941	N.D.	
26) Benzo(k)fluoranthene	12.667	252	941	N.D.	
27) Benzo(a)pyrene	12.972	252	194	N.D.	
28) Indeno(1,2,3-cd)pyrene	14.307	276	308	N.D.	
29) Dibenz(a,h)anthracene	14.329	278	252	N.D.	
30) Benzo(g,h,i)perylene	14.676	276	309	N.D.	

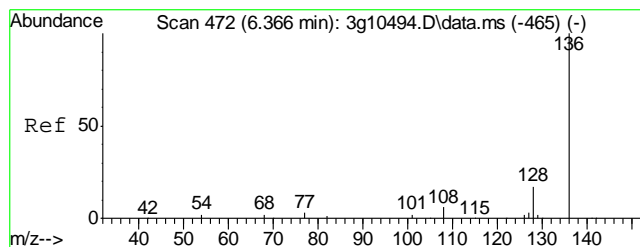
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\103112\  
Data File : 3g11850.D  
Acq On : 31 Oct 2012 7:02 pm  
Operator : DONC  
Sample : D40328-1  
Misc : OP6884,E3G558,5.36,,,1,1  
ALS Vial : 21 Sample Multiplier: 1

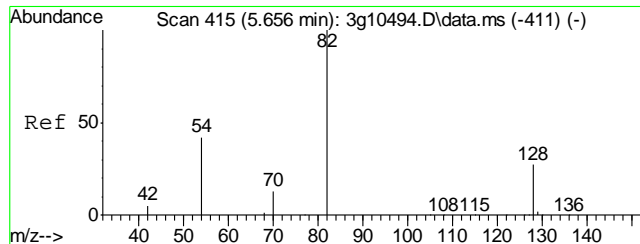
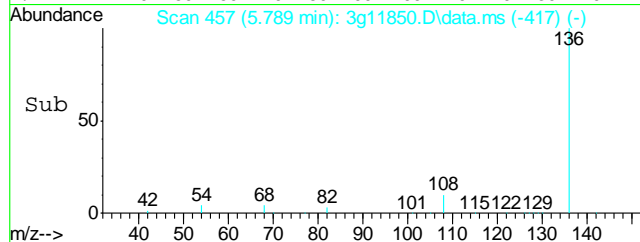
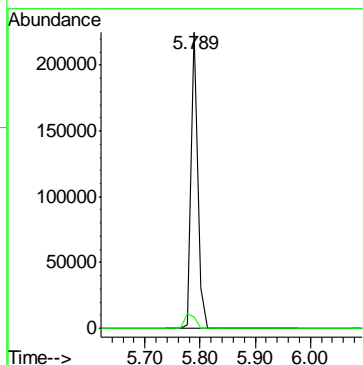
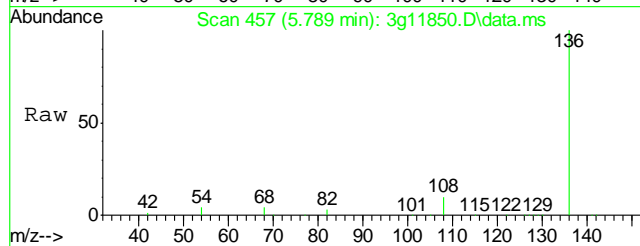
Quant Time: Nov 02 09:51:01 2012  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G558.M  
Quant Title : PAHSIM BASE  
QLast Update : Wed Oct 31 14:49:52 2012  
Response via : Initial Calibration





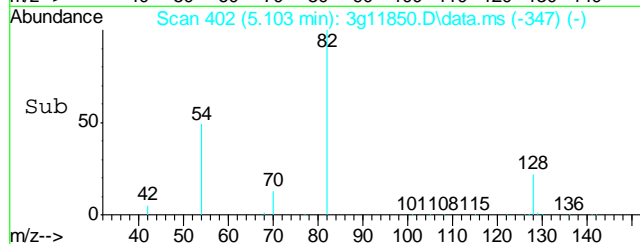
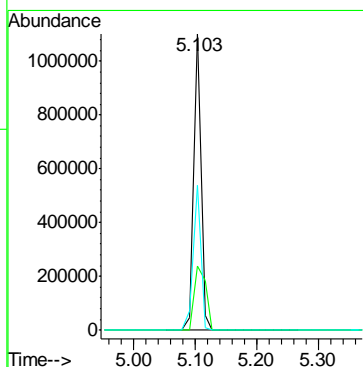
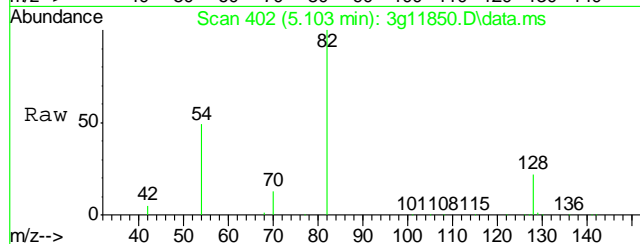
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.789 min Scan# 457  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

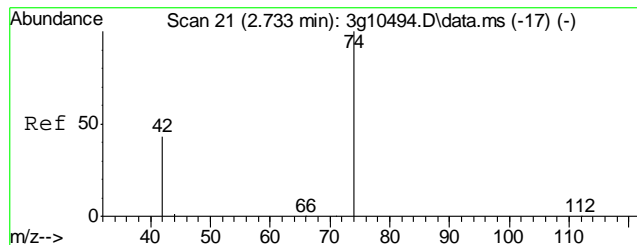
Tgt Ion	Ratio	Lower	Upper
136	100		
68	7.9	0.0	28.7



#2  
Nitrobenzene-d5  
Concen: 37.4339 ug/mL  
RT: 5.103 min Scan# 402  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

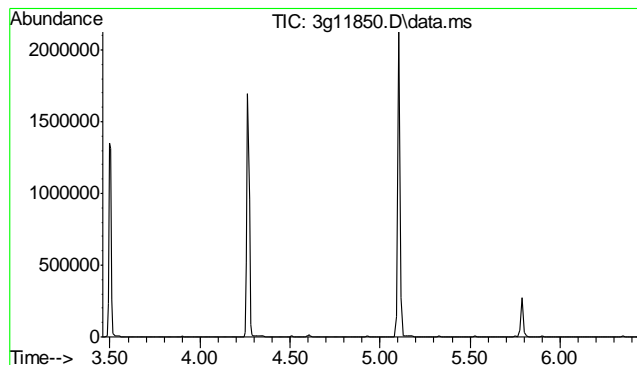
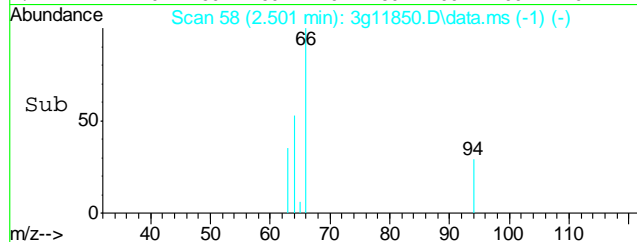
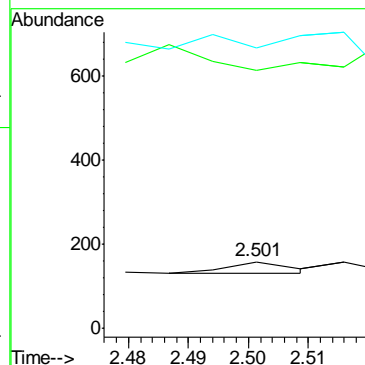
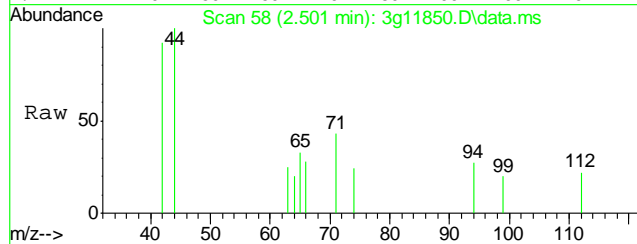
Tgt Ion	Ratio	Lower	Upper
82	100		
128	35.3	17.4	57.4
54	51.6	32.8	72.8





#3  
N-Nitrosodimethylamine  
Concen: Below ug/mL  
RT: 2.501 min Scan# 58  
Delta R.T. 0.015 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

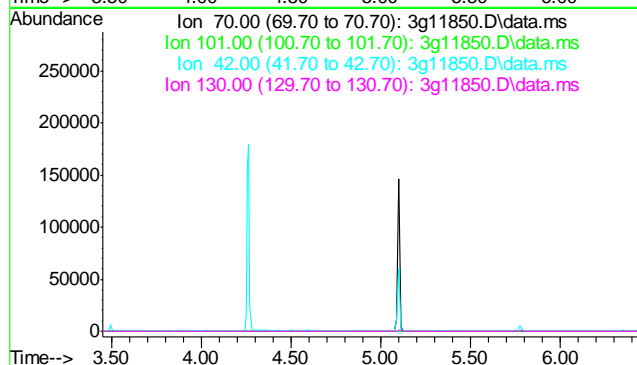
Tgt Ion	Ratio	Lower	Upper
74	100		
42	394.7	53.7	93.7#
44	0.0	0.0	24.1

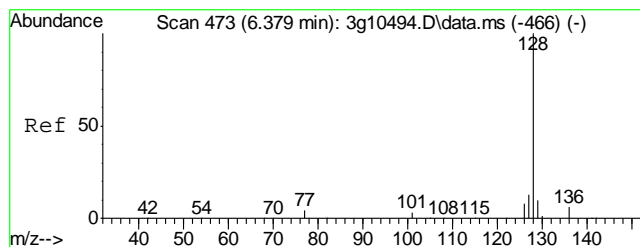


#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 4.95 min

Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

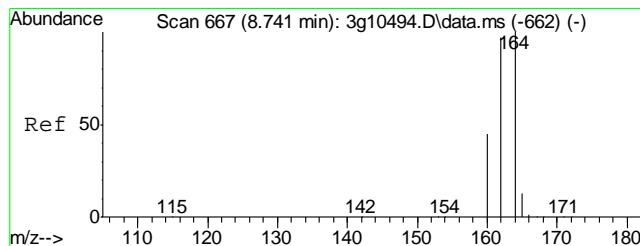
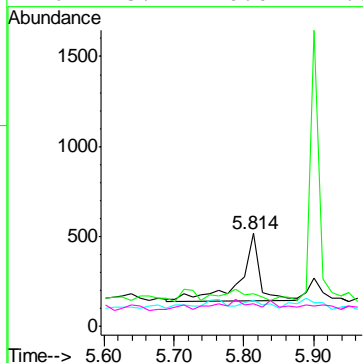
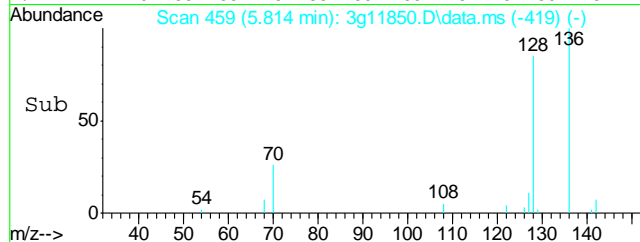
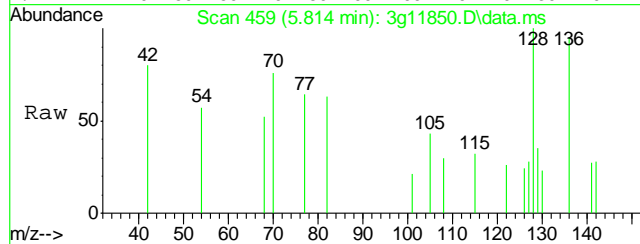
Tgt Ion	Sig	Exp Ratio
70	100	
101	12.3	
42	51.9	
130	24.1	





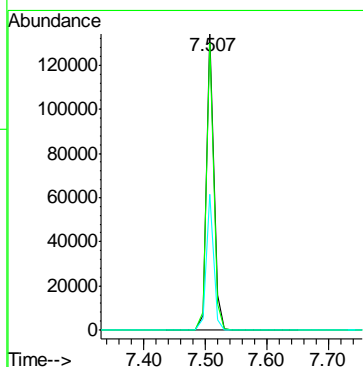
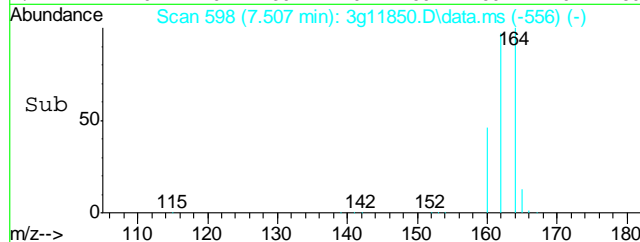
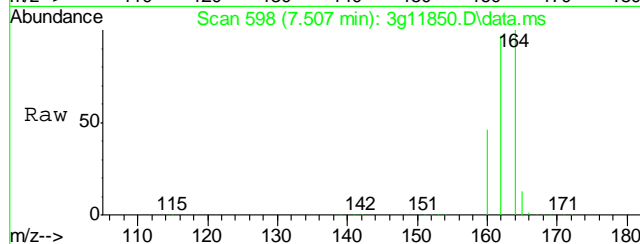
#5  
Naphthalene  
Concen: Below ug/mL  
RT: 5.814 min Scan# 459  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

Tgt Ion	128	Resp	724
Ion Ratio	100		
Lower		0.0	31.1
Upper		32.6	27.3

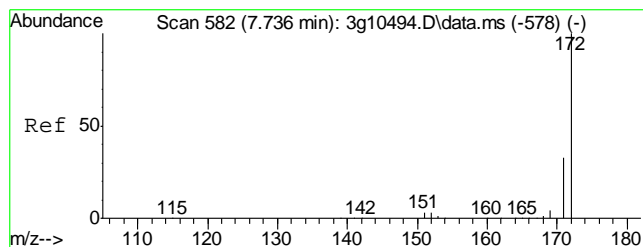


#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.507 min Scan# 598  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

Tgt Ion	164	Resp	111167
Ion Ratio <td>100</td> <td></td> <td></td>	100		
Lower		77.7	117.7
Upper		66.6	

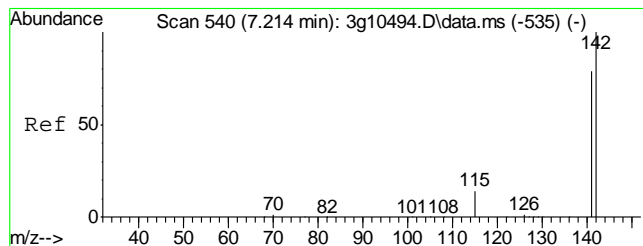
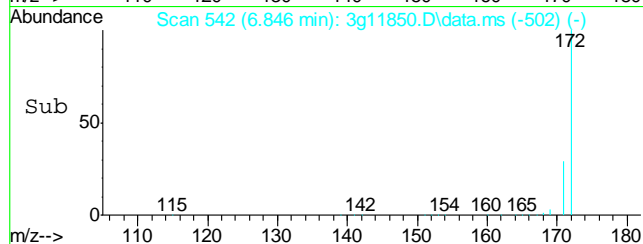
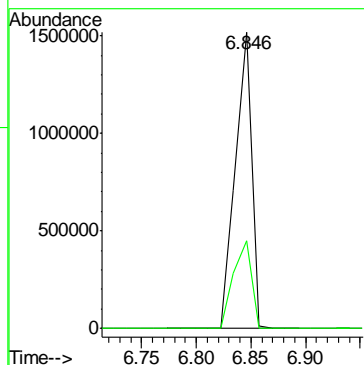
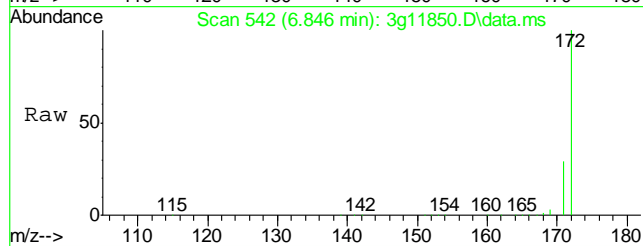






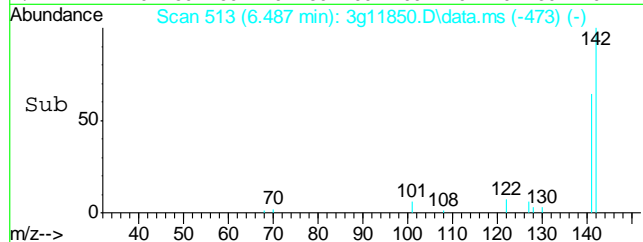
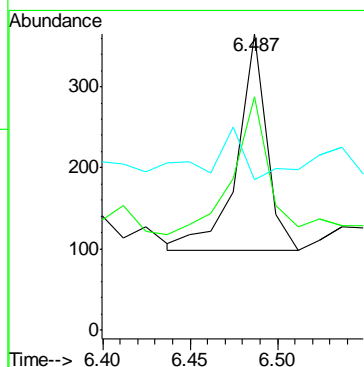
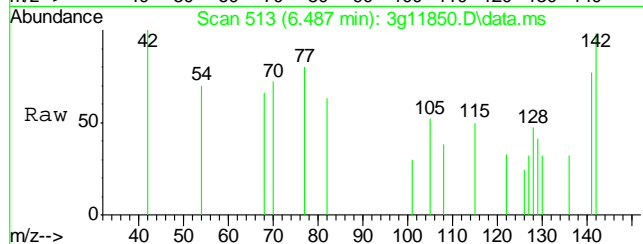
#7  
2-Fluorobiphenyl  
Concen: 34.8265 ug/mL  
RT: 6.846 min Scan# 542  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

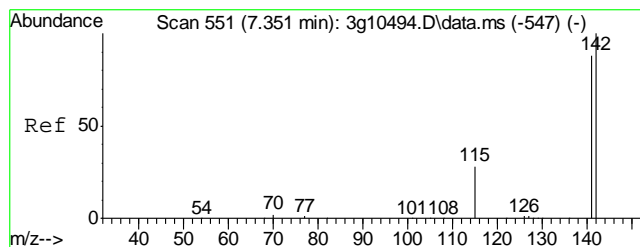
Tgt Ion	Ratio	Lower	Upper
172	100		
171	32.8	12.9	52.9



#8  
2-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.487 min Scan# 513  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

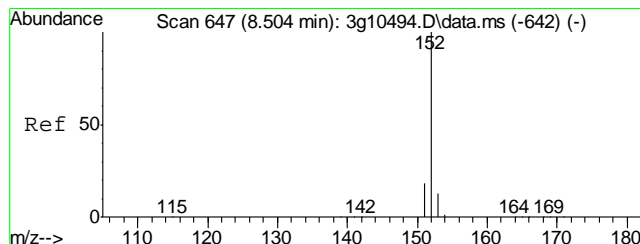
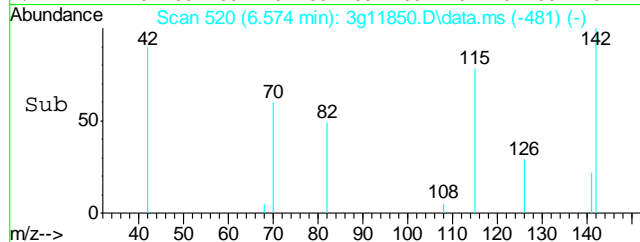
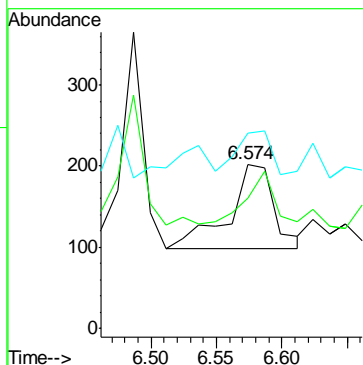
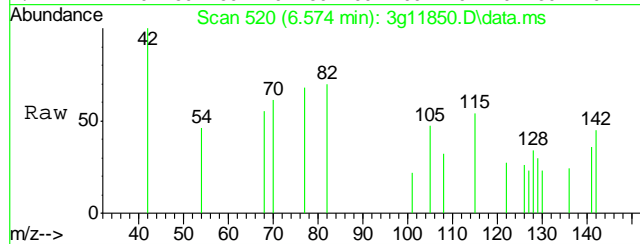
Tgt Ion	Ratio	Lower	Upper
142	100		
141	81.8	62.7	102.7
115	0.0	8.3	48.3





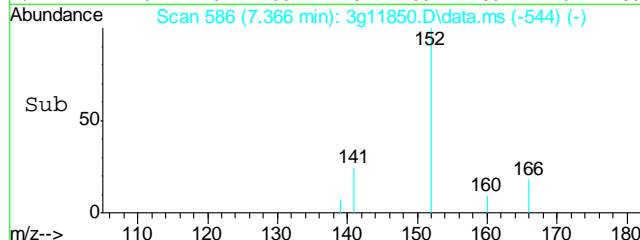
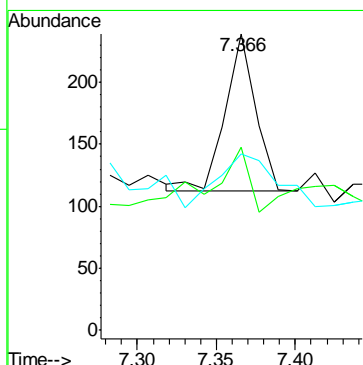
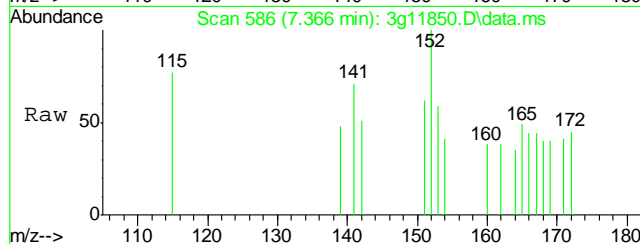
#9  
1-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.574 min Scan# 520  
Delta R.T. -0.012 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

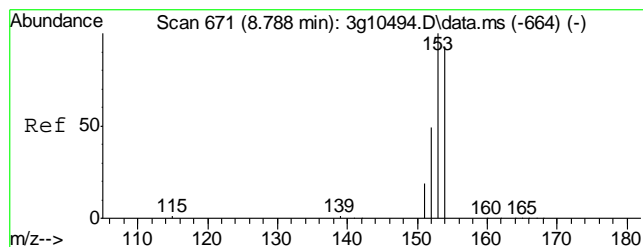
Tgt Ion	Ratio	Lower	Upper
142	100		
141	54.5	65.6	105.6#
115	0.0	14.0	54.0#



#10  
Acenaphthylene  
Concen: Below ug/mL  
RT: 7.366 min Scan# 586  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

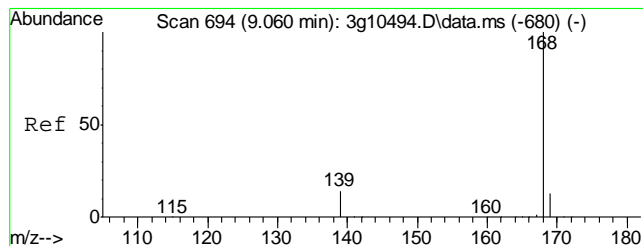
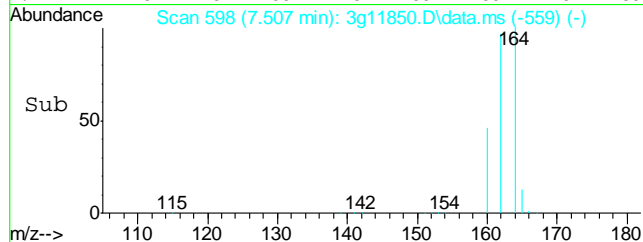
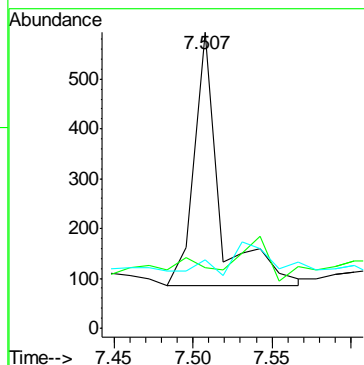
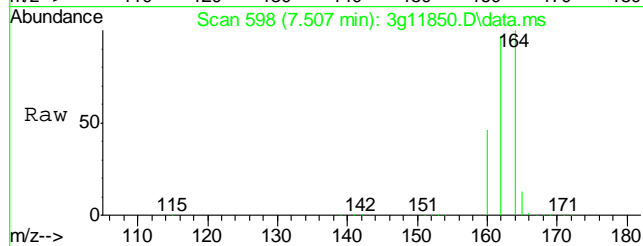
Tgt Ion	Ratio	Lower	Upper
152	100		
151	70.9	0.0	39.6#
153	66.3	0.0	33.0#





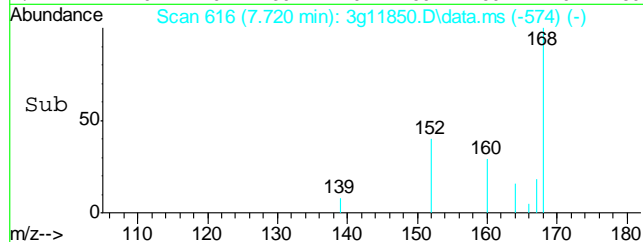
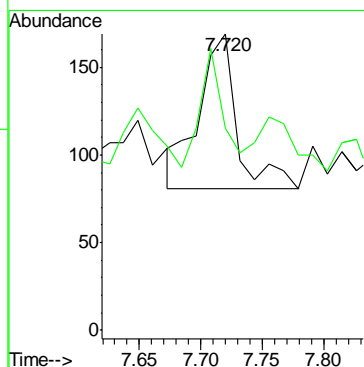
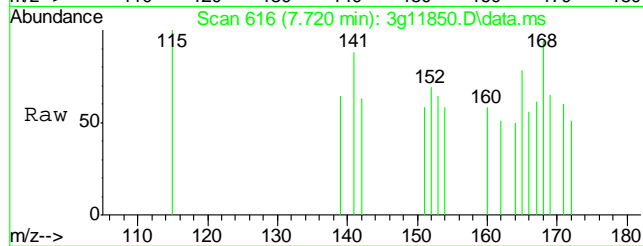
#11  
Acenaphthene  
Concen: Below ug/mL  
RT: 7.507 min Scan# 598  
Delta R.T. -0.035 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

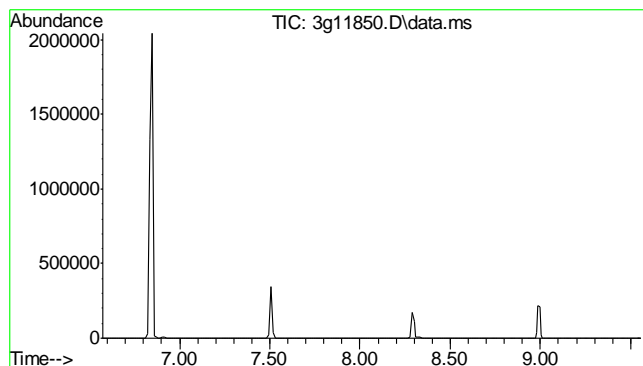
Tgt Ion	Ratio	Lower	Upper
154	100		
153	18.4	83.1	123.1#
152	0.0	29.1	69.1#



#12  
Dibenzofuran  
Concen: Below ug/mL  
RT: 7.720 min Scan# 616  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

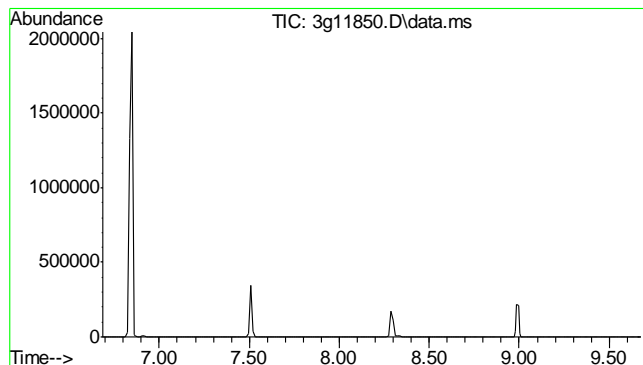
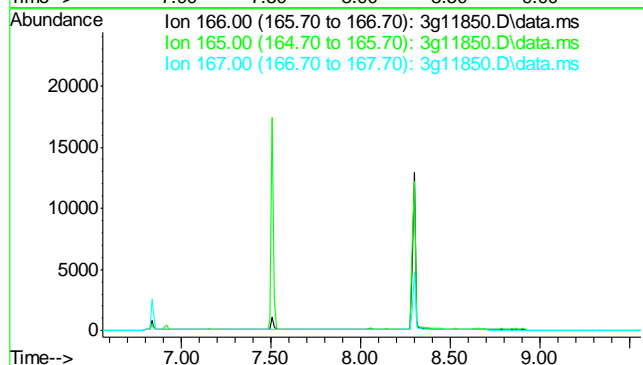
Tgt Ion	Ratio	Lower	Upper
168	100		
139	45.0	14.1	54.1





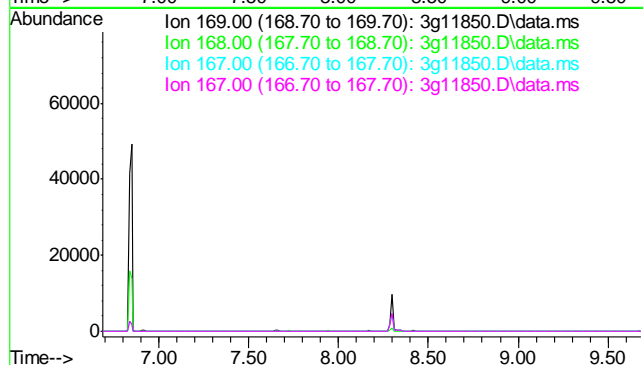
#13  
 Fluorene  
 Concen: N.D. ug/mL  
 Expected RT: 8.06 min  
  
 Lab File: 3g11850.D  
 Acq: 31 Oct 12 7:02 pm

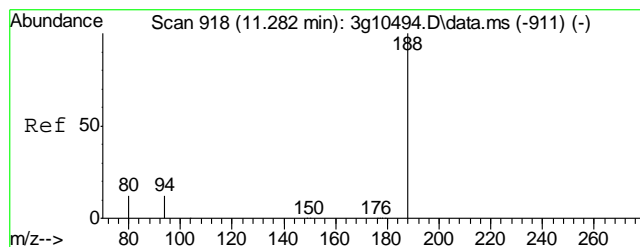
Tgt Ion	Exp Ratio
166	100
165	92.9
167	13.2



#14  
 Diphenylamine  
 Concen: N.D. ug/mL  
 Expected RT: 8.18 min  
  
 Lab File: 3g11850.D  
 Acq: 31 Oct 12 7:02 pm

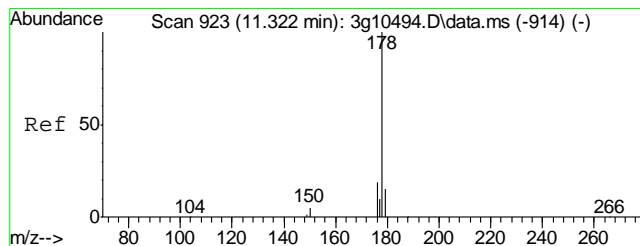
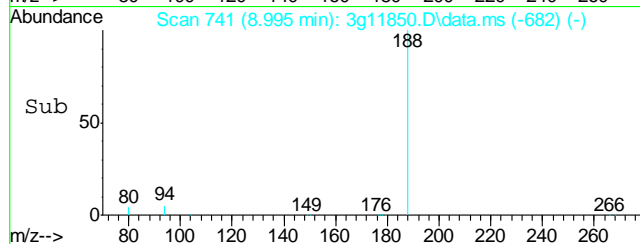
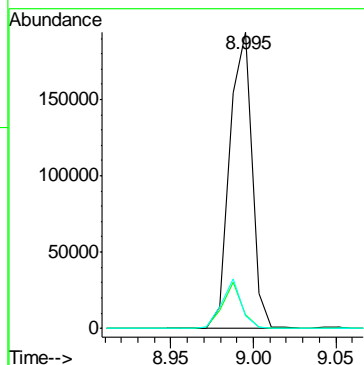
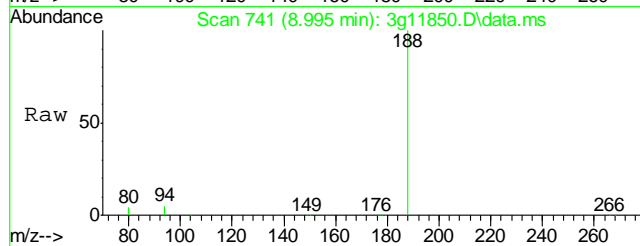
Tgt Ion	Exp Ratio
169	100
168	62.0
167	34.1
167	34.1





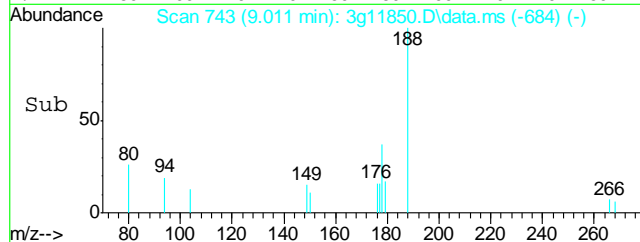
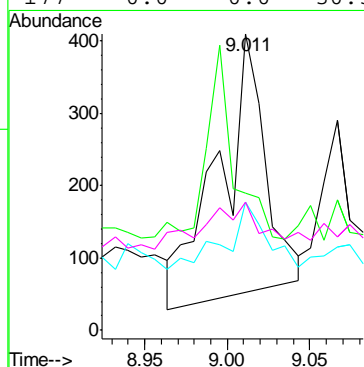
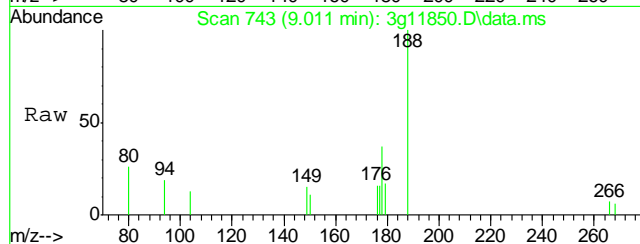
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 8.995 min Scan# 741  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

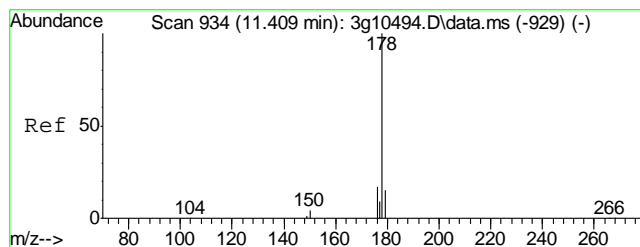
Tgt Ion:188	Resp:	184086
Ion Ratio	Lower	Upper
188	100	
94	13.3	0.0 33.4
80	14.1	0.0 34.7



#16  
Phenanthrene  
Concen: Below ug/mL  
RT: 9.011 min Scan# 743  
Delta R.T. -0.008 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

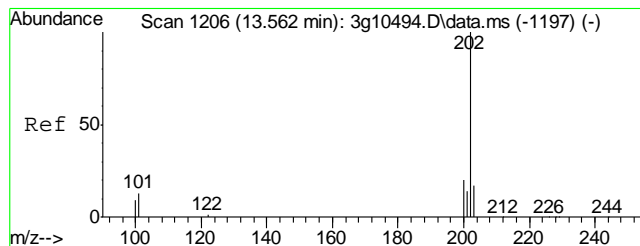
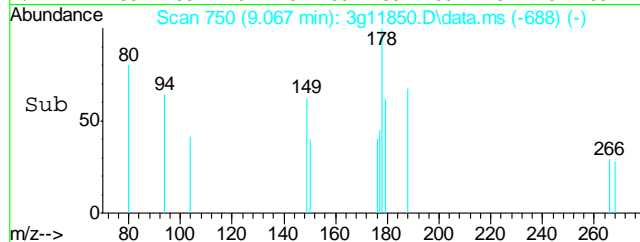
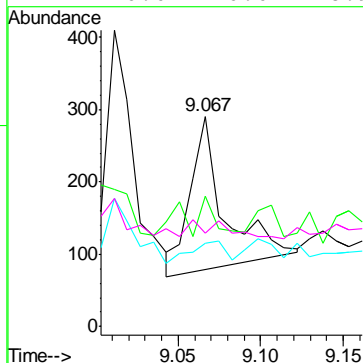
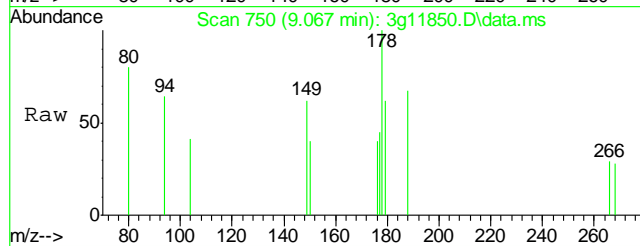
Tgt Ion:178	Resp:	705
Ion Ratio	Lower	Upper
178	100	
179	57.6	0.0 35.2#
176	30.4	0.0 38.9
177	0.0	0.0 30.3





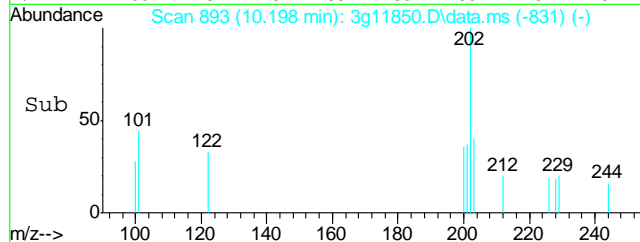
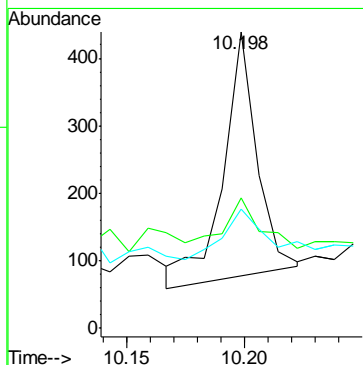
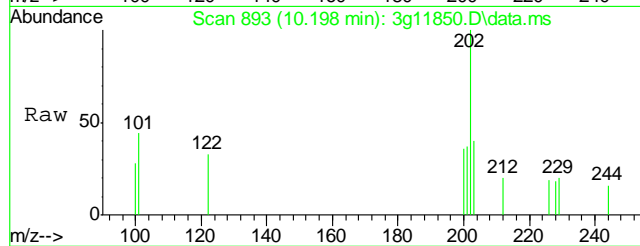
#17  
 Anthracene  
 Concen: Below ug/mL  
 RT: 9.067 min Scan# 750  
 Delta R.T. -0.008 min  
 Lab File: 3g11850.D  
 Acq: 31 Oct 12 7:02 pm

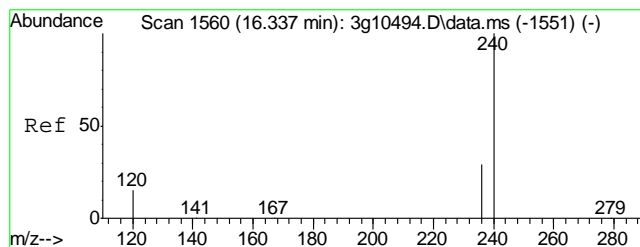
Tgt Ion:	178	Resp:	312
Ion Ratio	Lower	Upper	
178	100		
179	0.0	0.0	35.1
176	0.0	0.0	38.3
177	0.0	0.0	28.9



#18  
 Fluoranthene  
 Concen: Below ug/mL  
 RT: 10.198 min Scan# 893  
 Delta R.T. -0.008 min  
 Lab File: 3g11850.D  
 Acq: 31 Oct 12 7:02 pm

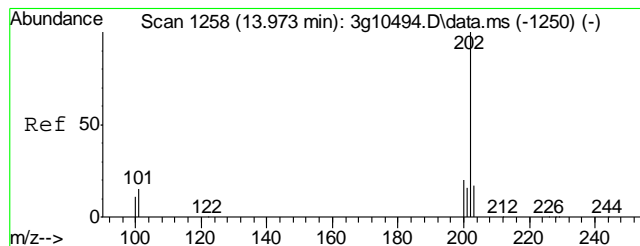
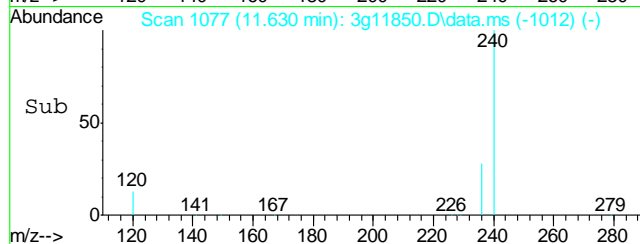
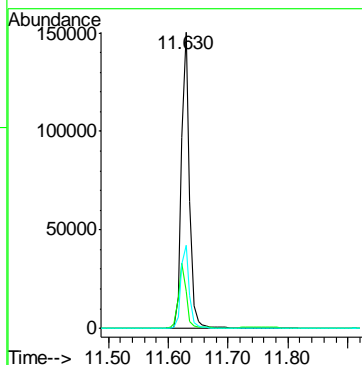
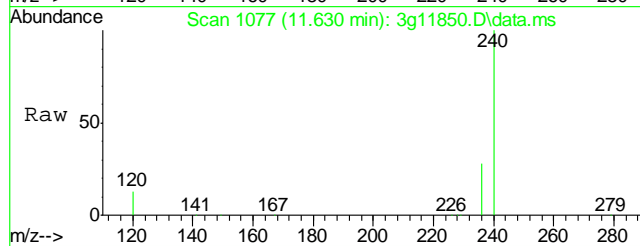
Tgt Ion:	202	Resp:	366
Ion Ratio	Lower	Upper	
202	100		
101	18.9	0.0	33.9
203	29.0	0.0	37.2





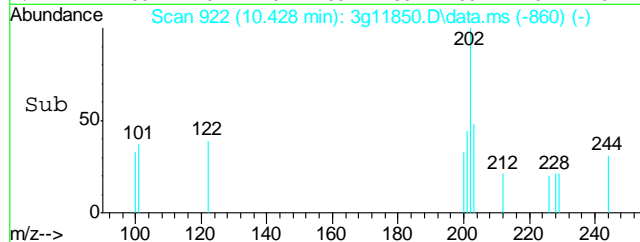
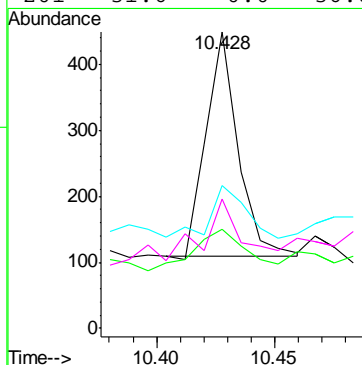
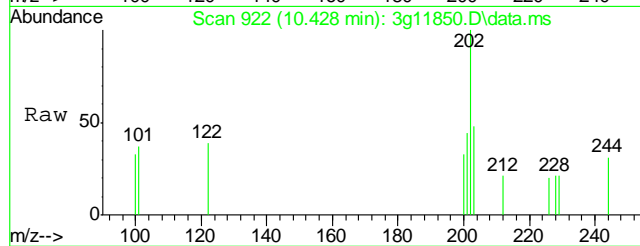
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.630 min Scan# 1077  
Delta R.T. -0.007 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

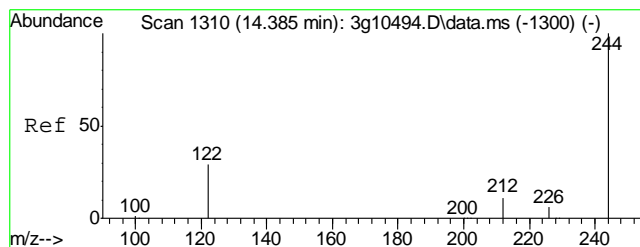
Tgt Ion	Ratio	Lower	Upper
240	100		
120	21.2	1.4	41.4
236	29.5	9.7	49.7



#20  
Pyrene  
Concen: Below ug/mL  
RT: 10.428 min Scan# 922  
Delta R.T. -0.008 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

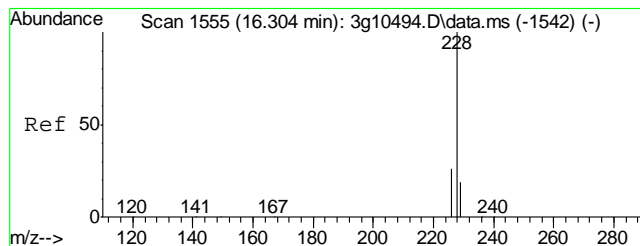
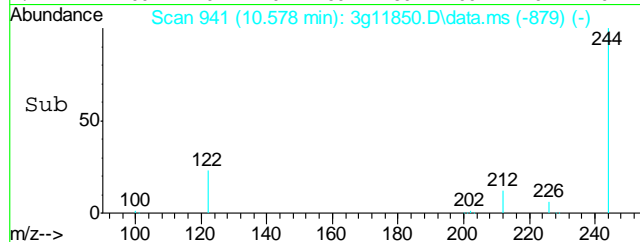
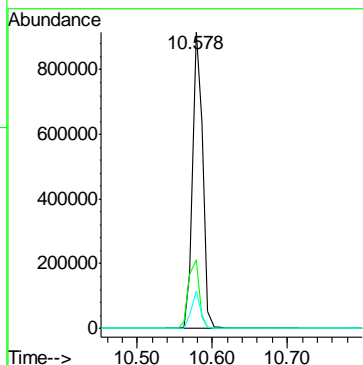
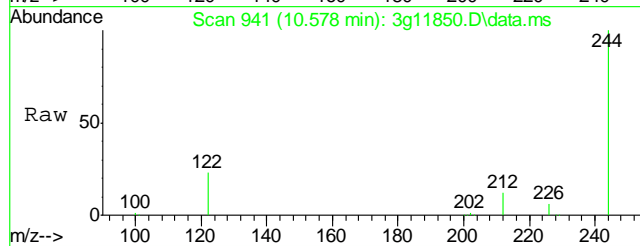
Tgt Ion	Ratio	Lower	Upper
202	100		
200	30.0	0.8	40.8
203	22.2	0.0	37.9
201	31.6	0.0	36.8





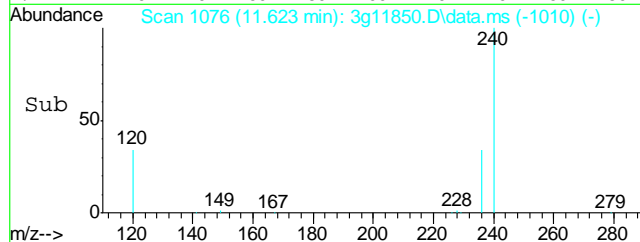
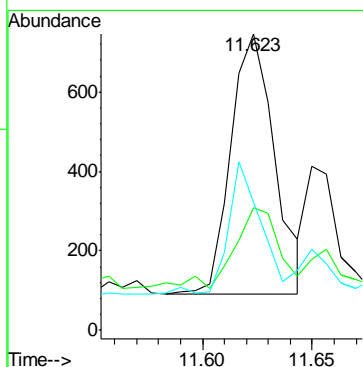
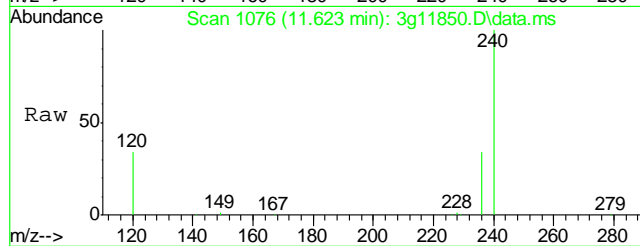
#21  
Terphenyl-d14  
Concen: 43.0793 ug/mL  
RT: 10.578 min Scan# 941  
Delta R.T. -0.008 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

Tgt Ion	Ratio	Lower	Upper
244	100		
122	24.7	6.6	46.6
212	11.4	0.0	31.7

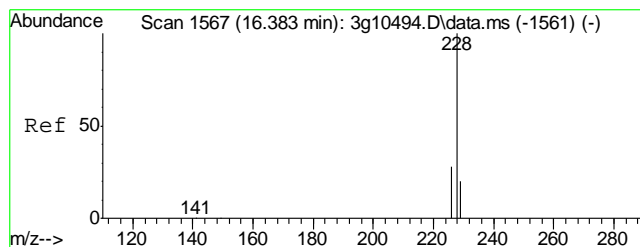


#22  
Benzo(a)anthracene  
Concen: Below ug/mL  
RT: 11.623 min Scan# 1076  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

Tgt Ion	Ratio	Lower	Upper
228	100		
229	30.4	0.0	39.5
226	37.5	7.1	47.1

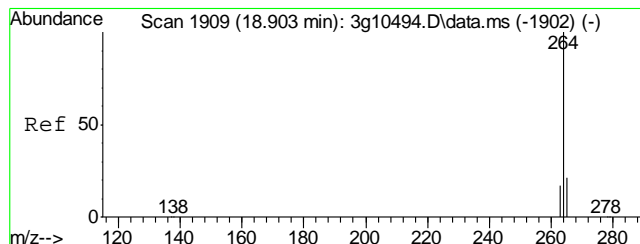
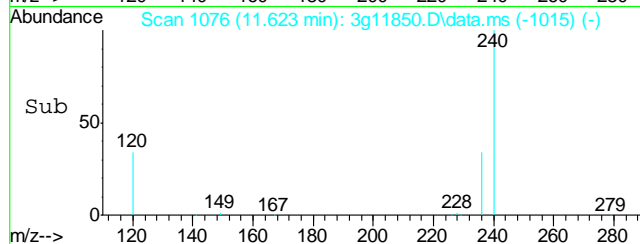
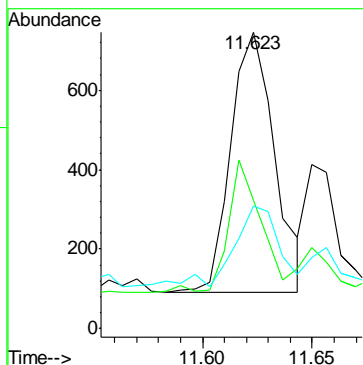
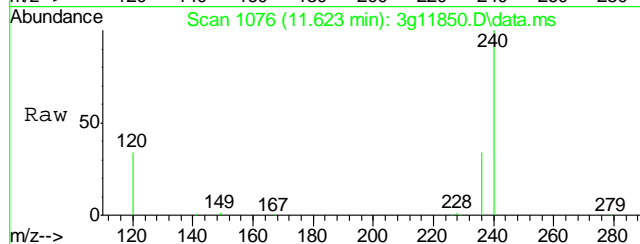






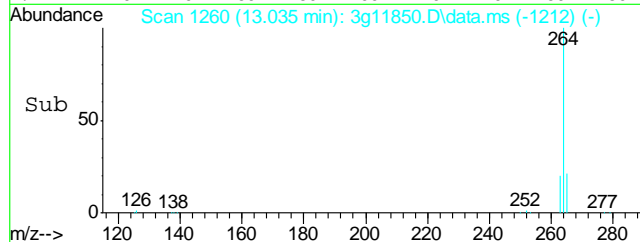
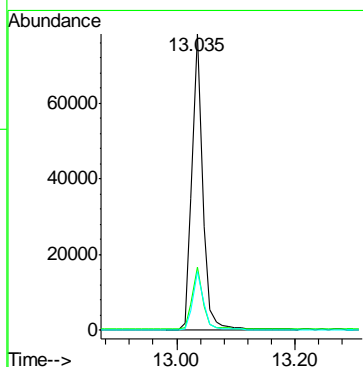
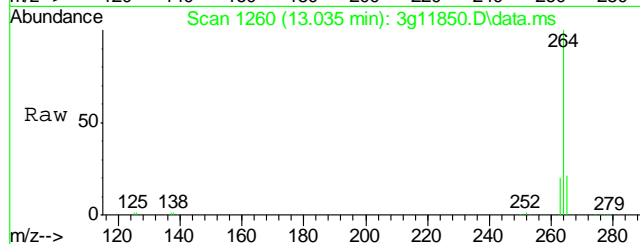
#23  
Chrysene  
Concen: Below ug/mL  
RT: 11.623 min Scan# 1076  
Delta R.T. -0.040 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

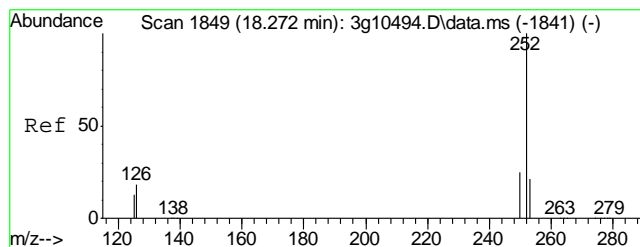
Tgt Ion	Ratio	Lower	Upper
228	100		
226	37.5	9.6	49.6
229	30.4	0.0	39.3



#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 13.035 min Scan# 1260  
Delta R.T. 0.000 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

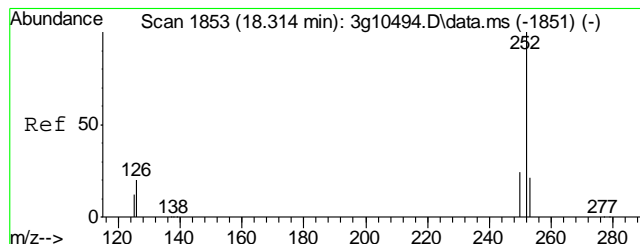
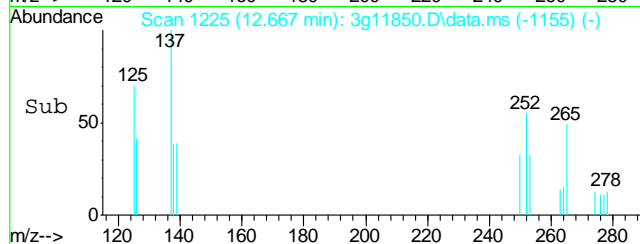
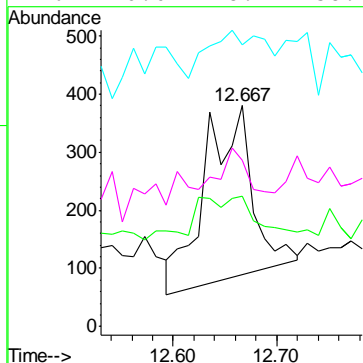
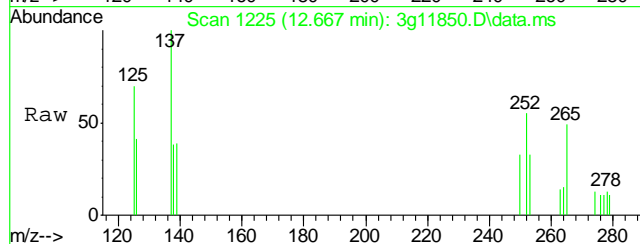
Tgt Ion	Ratio	Lower	Upper
264	100		
265	20.5	1.2	41.2
263	19.5	0.0	39.6





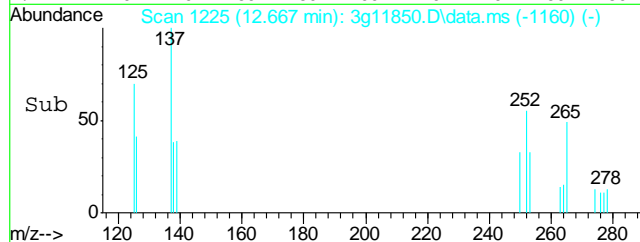
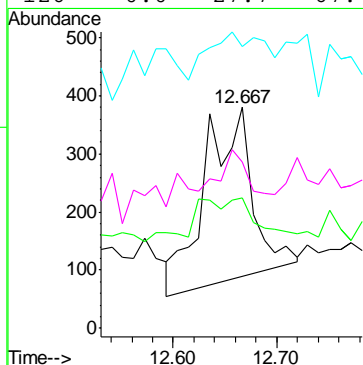
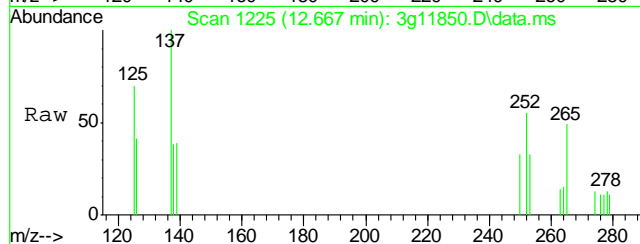
#25  
Benzo(b)fluoranthene  
Concen: Below ug/mL  
RT: 12.667 min Scan# 1225  
Delta R.T. 0.021 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

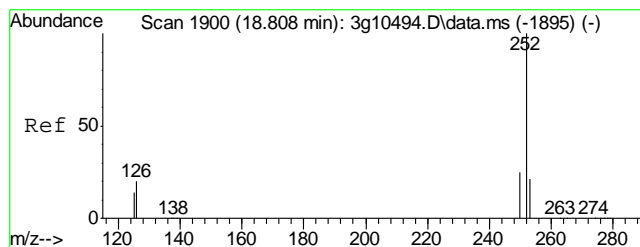
Tgt Ion	Ratio	Lower	Upper
252	100		
253	11.9	1.0	41.0
125	0.0	6.5	46.5#
126	0.0	18.4	58.4#



#26  
Benzo(k)fluoranthene  
Concen: Below ug/mL  
RT: 12.667 min Scan# 1225  
Delta R.T. -0.010 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

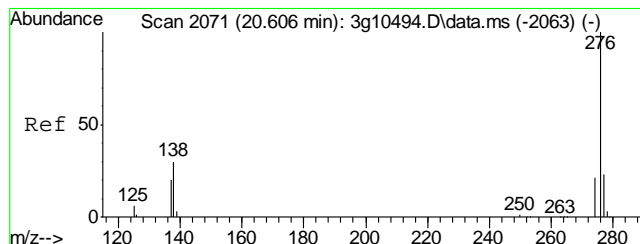
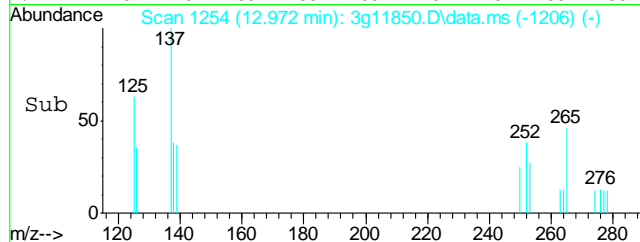
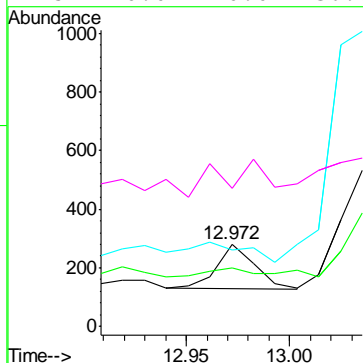
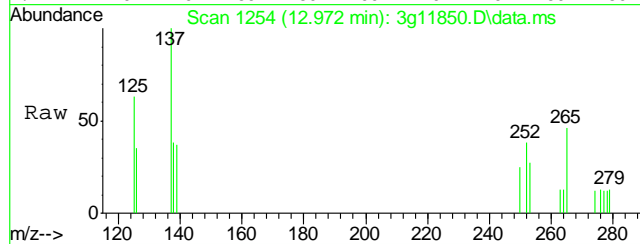
Tgt Ion	Ratio	Lower	Upper
252	100		
253	11.9	6.1	46.1
125	0.0	12.9	52.9#
126	0.0	27.7	67.7#





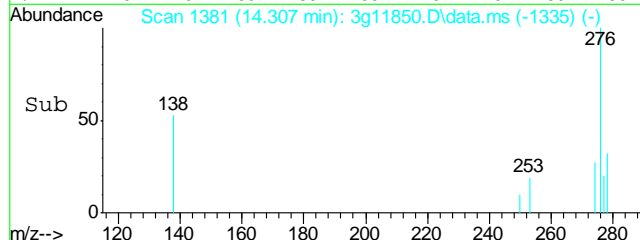
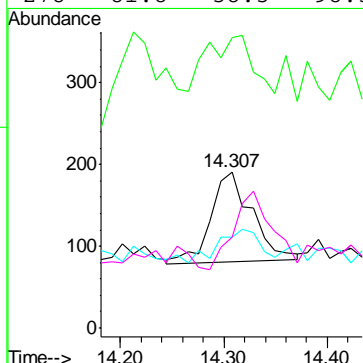
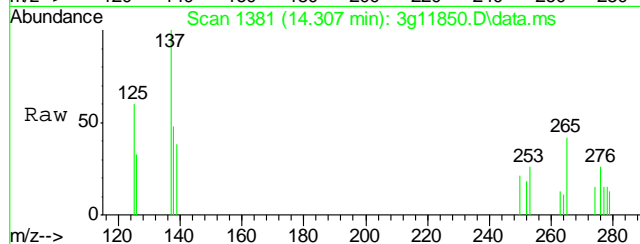
#27  
Benzo(a)pyrene  
Concen: Below ug/mL  
RT: 12.972 min Scan# 1254  
Delta R.T. -0.010 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

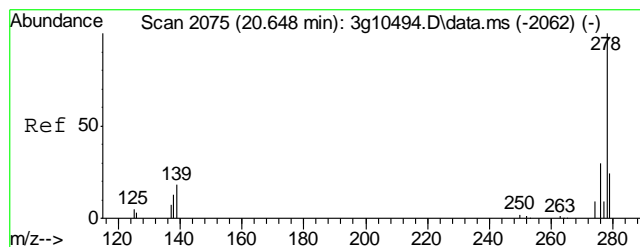
Tgt Ion:	252	Resp:	194
Ion Ratio	Lower	Upper	
252	100		
253	0.0	1.7	41.7#
126	0.0	1.5	41.5#
125	0.0	0.0	36.0



#28  
Indeno(1,2,3-cd)pyrene  
Concen: Below ug/mL  
RT: 14.307 min Scan# 1381  
Delta R.T. -0.021 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

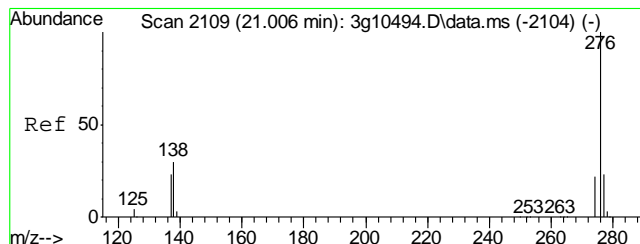
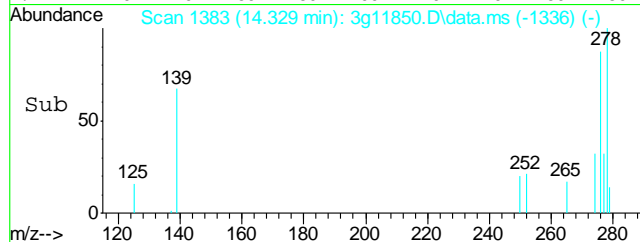
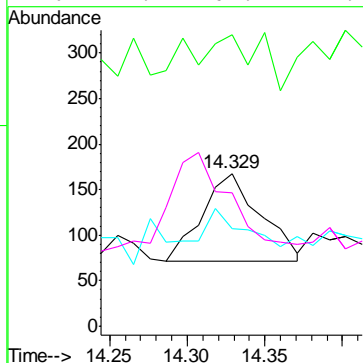
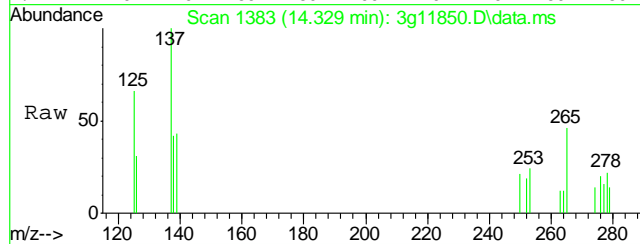
Tgt Ion:	276	Resp:	308
Ion Ratio	Lower	Upper	
276	100		
138	74.0	24.2	64.2#
277	38.6	5.0	45.0
278	81.8	58.5	98.5





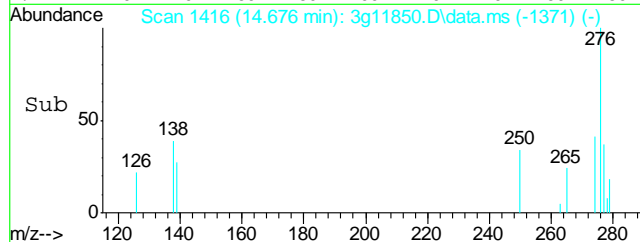
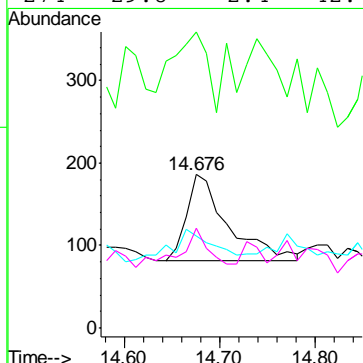
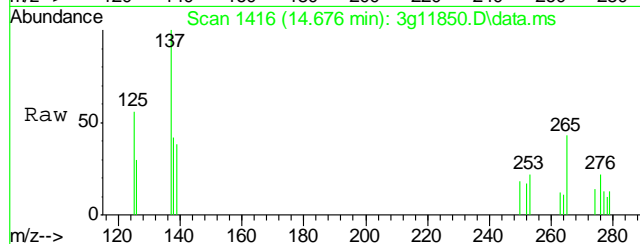
#29  
Dibenz(a,h)anthracene  
Concen: Below ug/mL  
RT: 14.329 min Scan# 1383  
Delta R.T. -0.011 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

Tgt Ion: 278 Resp: 252  
Ion Ratio Lower Upper  
278 100  
139 72.2 13.5 53.5#  
279 37.3 3.1 43.1  
276 122.2 107.4 147.4



#30  
Benzo(g,h,i)perylene  
Concen: Below ug/mL  
RT: 14.676 min Scan# 1416  
Delta R.T. -0.032 min  
Lab File: 3g11850.D  
Acq: 31 Oct 12 7:02 pm

Tgt Ion: 276 Resp: 309  
Ion Ratio Lower Upper  
276 100  
138 79.0 18.4 58.4#  
277 38.2 3.6 43.6  
274 29.8 2.4 42.4



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\103112\  
 Data File : 3g11847.D  
 Acq On : 31 Oct 2012 5:50 pm  
 Operator : DONC  
 Sample : OP6884-MB  
 Misc : OP6884,E3G558,30.00,,,1,1  
 ALS Vial : 18 Sample Multiplier: 1

Quant Time: Nov 02 09:40:27 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G558.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Wed Oct 31 14:49:52 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.789	136	181249	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.507	164	106571	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.995	188	174119	4.0000	ug/mL	0.00
19) Chrysene-d12	11.630	240	127938	4.0000	ug/mL	0.00
24) Perylene-d12	13.035	264	90622	4.0000	ug/mL	0.00

## System Monitoring Compounds

2) Nitrobenzene-d5	5.103	82	824592	36.7959	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	73.60%		
7) 2-Fluorobiphenyl	6.846	172	1582798	35.7721	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	71.54%		
21) Terphenyl-d14	10.578	244	792729	43.5682	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	87.14%		

## Target Compounds

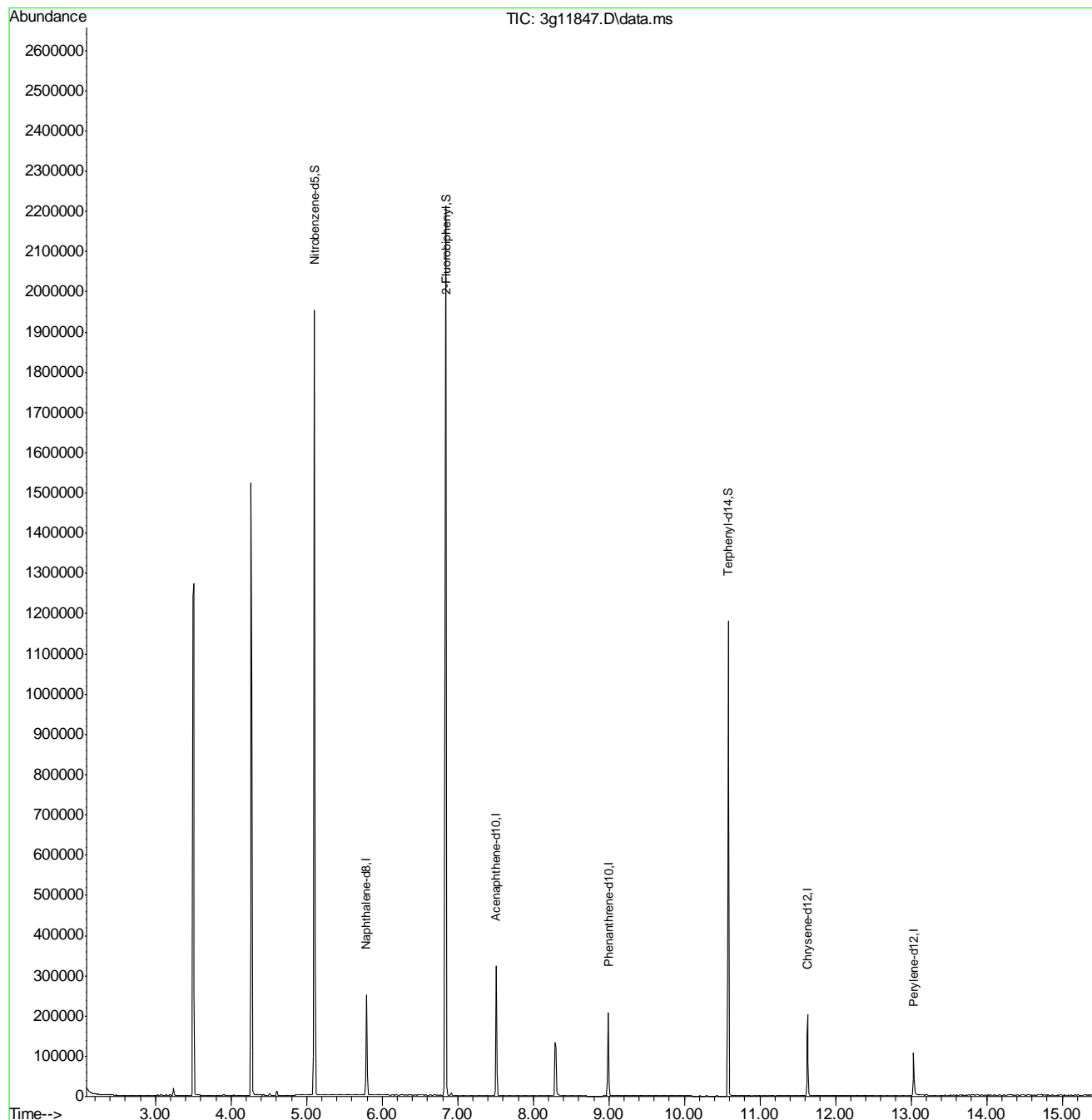
					Qvalue
3) N-Nitrosodimethylamine	2.472	74	54	N.D.	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d
5) Naphthalene	5.814	128	409	N.D.	
8) 2-Methylnaphthalene	6.487	142	176	N.D.	
9) 1-Methylnaphthalene	6.587	142	153	N.D.	
10) Acenaphthylene	7.366	152	121	N.D.	
11) Acenaphthene	7.507	154	615	N.D.	
12) Dibenzofuran	7.555	168	57	N.D.	
13) Fluorene	0.000	166	0	N.D.	d
14) Diphenylamine	0.000	169	0	N.D.	d
16) Phenanthrene	9.011	178	464	N.D.	
17) Anthracene	9.067	178	149	N.D.	
18) Fluoranthene	10.198	202	169	N.D.	
20) Pyrene	10.428	202	204	N.D.	
22) Benzo(a)anthracene	11.623	228	718	N.D.	
23) Chrysene	11.650	228	249	N.D.	
25) Benzo(b)fluoranthene	12.635	252	276	N.D.	
26) Benzo(k)fluoranthene	12.635	252	276	N.D.	
27) Benzo(a)pyrene	12.972	252	113	N.D.	
28) Indeno(1,2,3-cd)pyrene	14.307	276	276	N.D.	
29) Dibenz(a,h)anthracene	14.318	278	91	N.D.	
30) Benzo(g,h,i)perylene	14.686	276	278	N.D.	

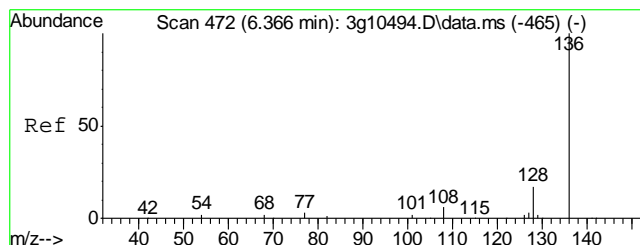
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\103112\  
Data File : 3g11847.D  
Acq On : 31 Oct 2012 5:50 pm  
Operator : DONC  
Sample : OP6884-MB  
Misc : OP6884,E3G558,30.00,,,1,1  
ALS Vial : 18 Sample Multiplier: 1

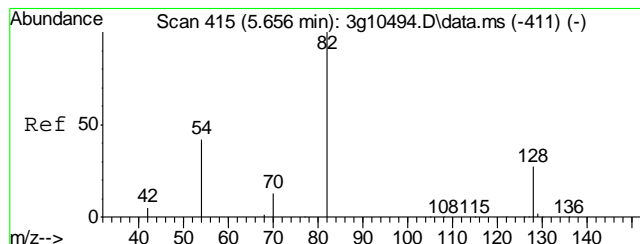
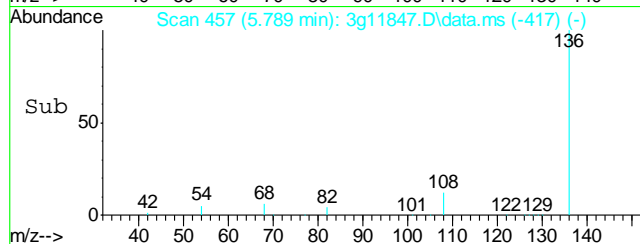
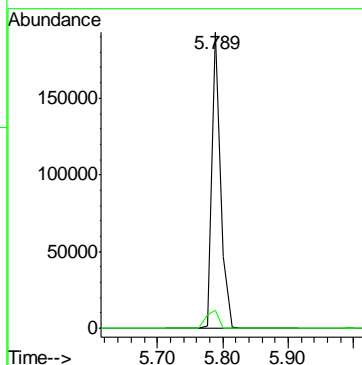
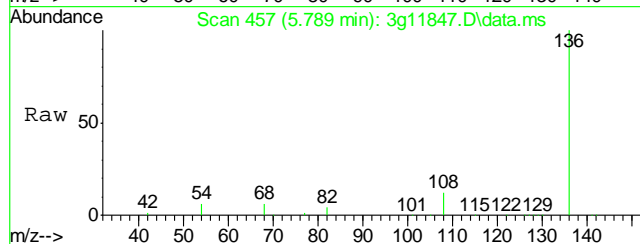
Quant Time: Nov 02 09:40:27 2012  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G558.M  
Quant Title : PAHSIM BASE  
QLast Update : Wed Oct 31 14:49:52 2012  
Response via : Initial Calibration





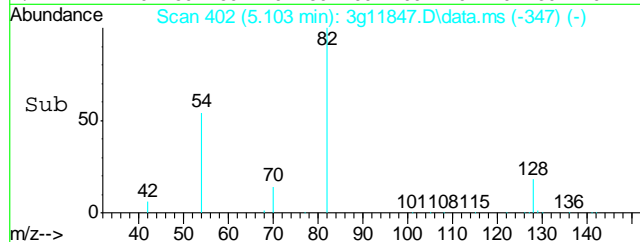
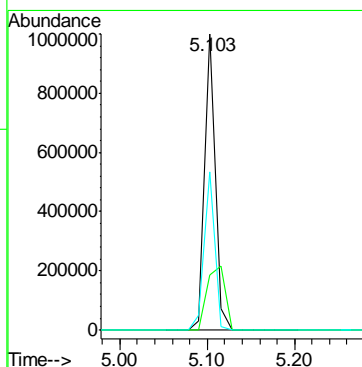
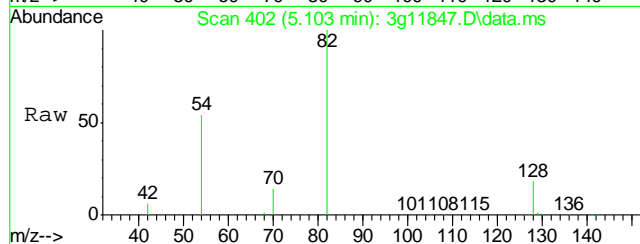
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.789 min Scan# 457  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

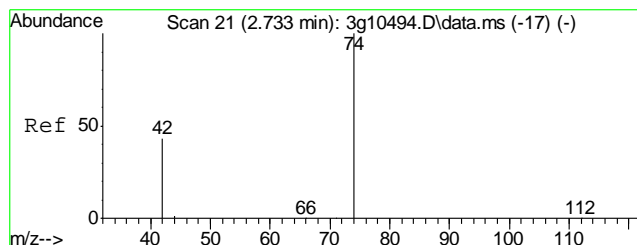
Tgt Ion:	136	Resp:	181249
Ion Ratio	Lower	Upper	
136	100		
68	8.2	0.0	28.7



#2  
Nitrobenzene-d5  
Concen: 36.7959 ug/mL  
RT: 5.103 min Scan# 402  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

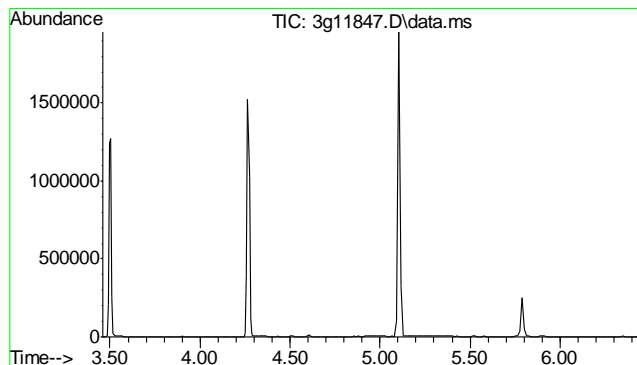
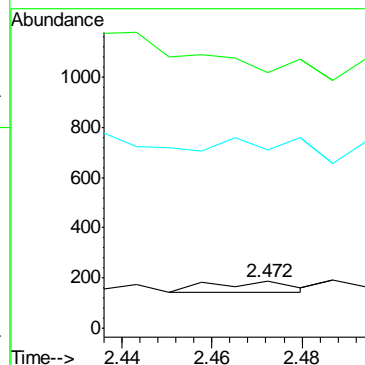
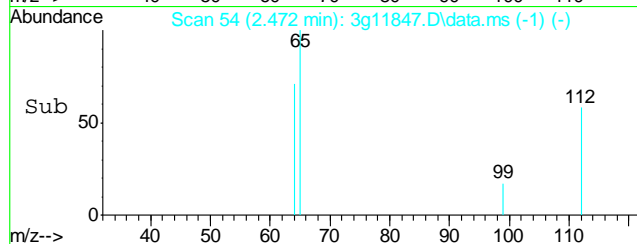
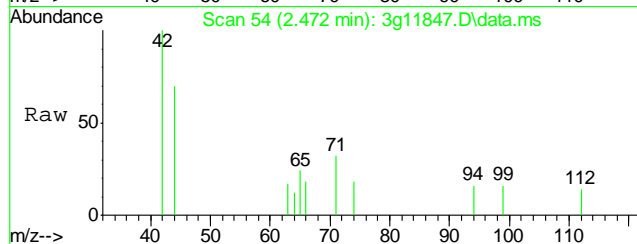
Tgt Ion:	82	Resp:	824592
Ion Ratio	Lower	Upper	
82	100		
128	36.5	17.4	57.4
54	54.1	32.8	72.8





#3  
N-Nitrosodimethylamine  
Concen: Below ug/mL  
RT: 2.472 min Scan# 54  
Delta R.T. -0.014 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

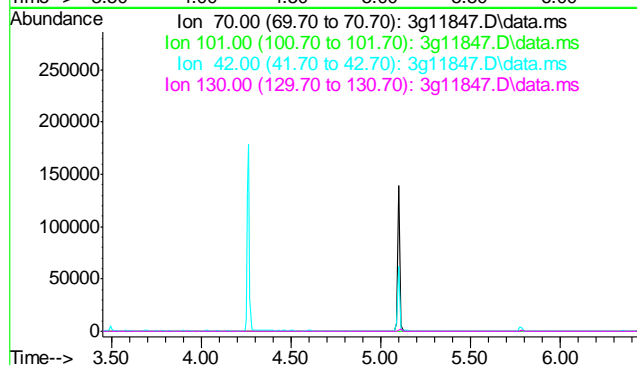
Tgt Ion: 74 Resp: 54  
Ion Ratio Lower Upper  
74 100  
42 0.0 53.7 93.7#  
44 207.4 0.0 24.1#



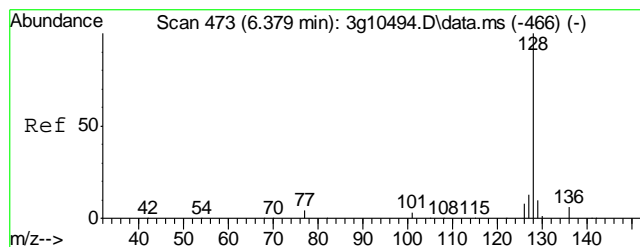
#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 4.95 min

Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

Tgt Ion: 70  
Sig Exp Ratio  
70 100  
101 12.3  
42 51.9  
130 24.1

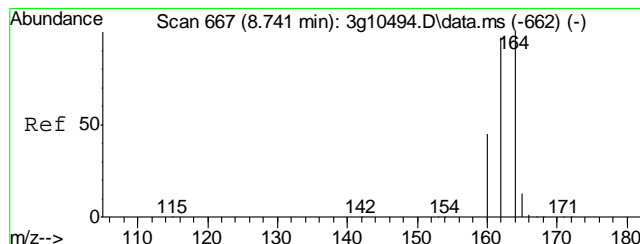
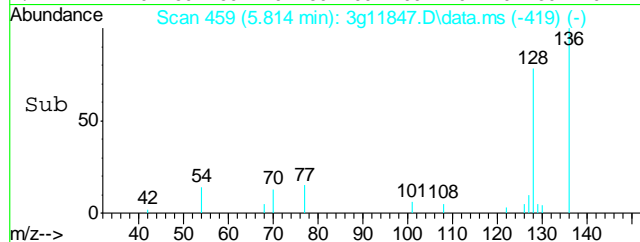
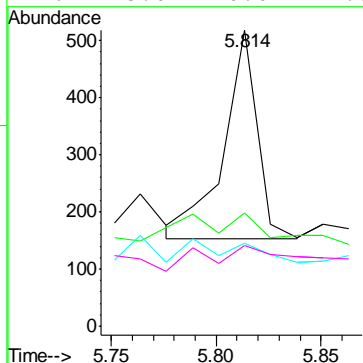
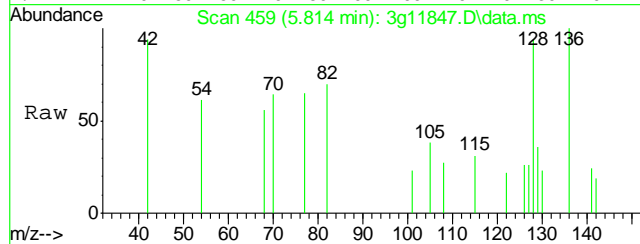






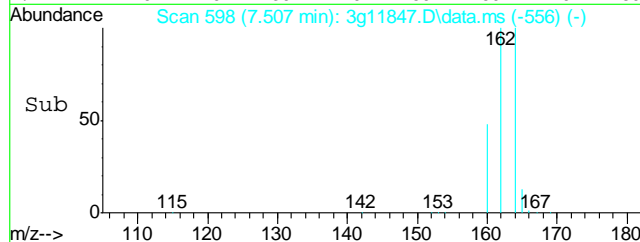
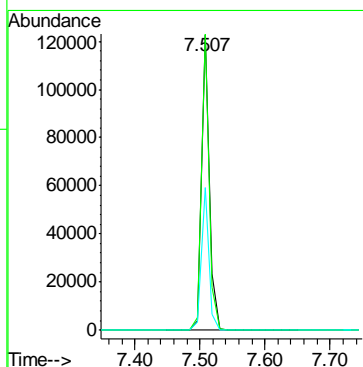
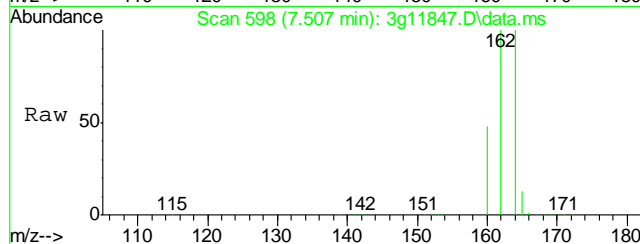
#5  
Naphthalene  
Concen: Below ug/mL  
RT: 5.814 min Scan# 459  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

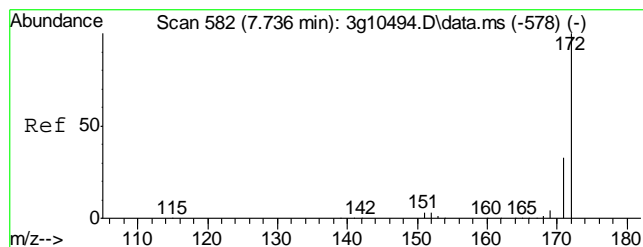
Tgt Ion	128	Resp	409
Ion Ratio	100		
Lower		0.0	31.1#
Upper		32.6	
129	35.5		
127	0.0		
126	43.0		27.3#



#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.507 min Scan# 598  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

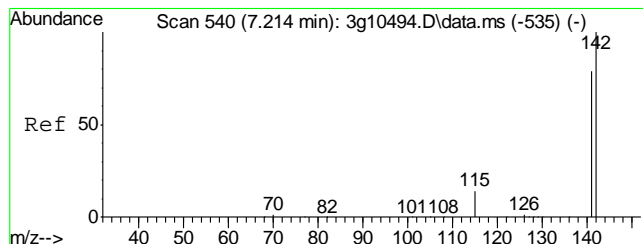
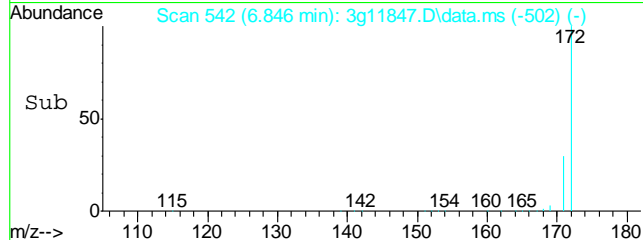
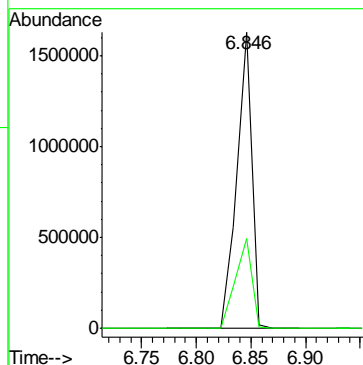
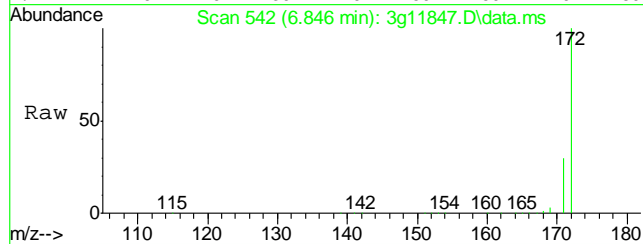
Tgt Ion	164	Resp	106571
Ion Ratio <td>100</td> <td></td> <td></td>	100		
Lower <td></td> <td>77.7</td> <td>117.7</td>		77.7	117.7
Upper <td></td> <td>66.6</td> <td></td>		66.6	
162	97.4		
160	46.3		





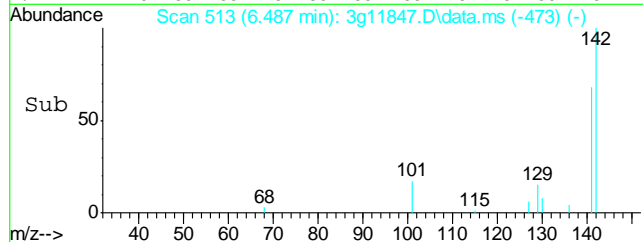
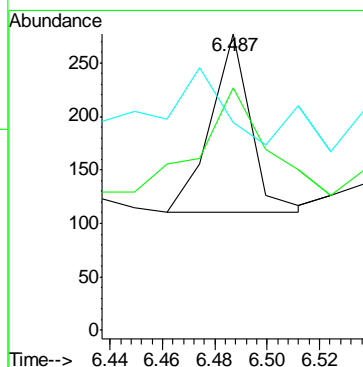
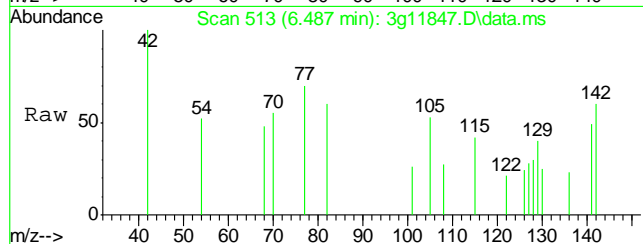
#7  
2-Fluorobiphenyl  
Concen: 35.7721 ug/mL  
RT: 6.846 min Scan# 542  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

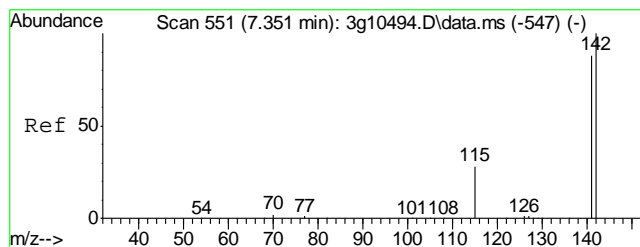
Tgt Ion:172 Resp: 1582798  
Ion Ratio Lower Upper  
172 100  
171 32.9 12.9 52.9



#8  
2-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.487 min Scan# 513  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

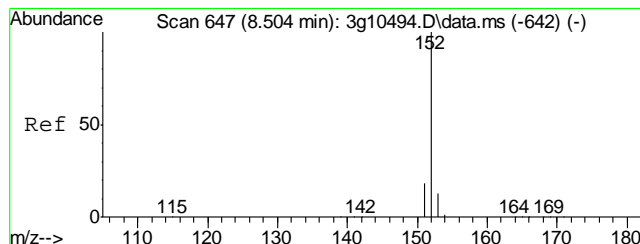
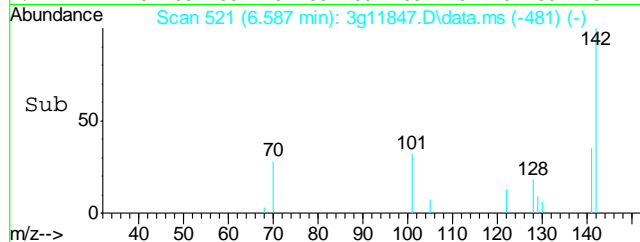
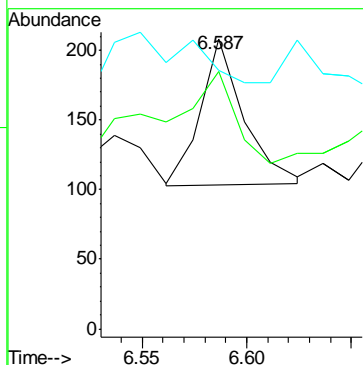
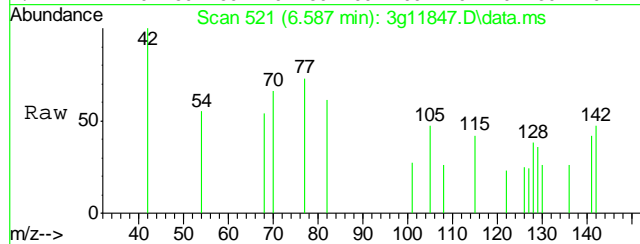
Tgt Ion:142 Resp: 176  
Ion Ratio Lower Upper  
142 100  
141 104.0 62.7 102.7#  
115 0.0 8.3 48.3#





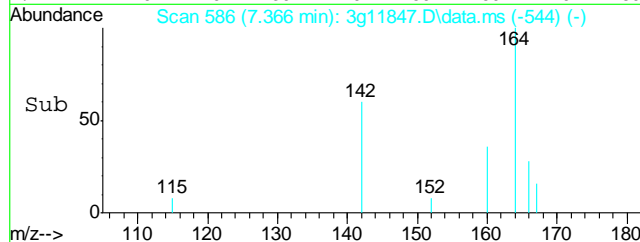
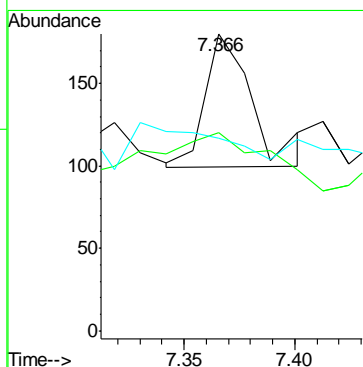
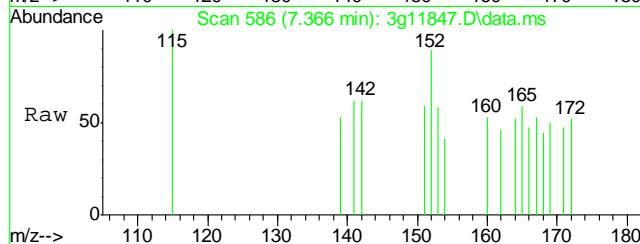
#9  
1-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.587 min Scan# 521  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

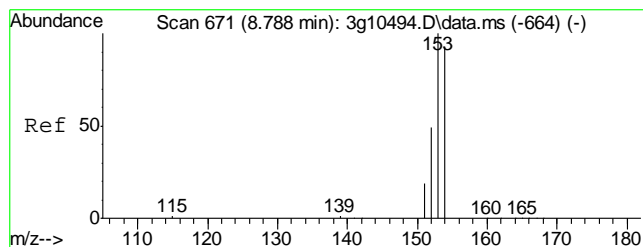
Tgt Ion: 142 Resp: 153  
Ion Ratio Lower Upper  
142 100  
141 107.2 65.6 105.6#  
115 0.0 14.0 54.0#



#10  
Acenaphthylene  
Concen: Below ug/mL  
RT: 7.366 min Scan# 586  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

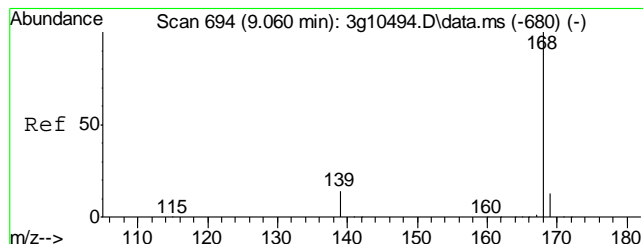
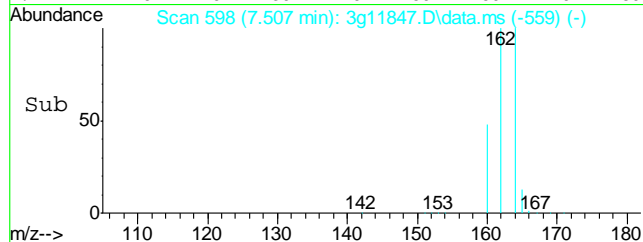
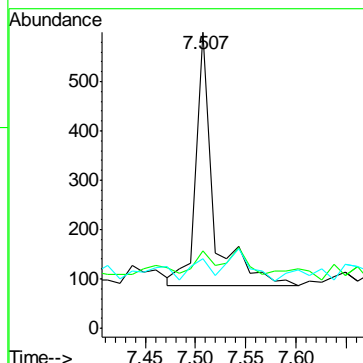
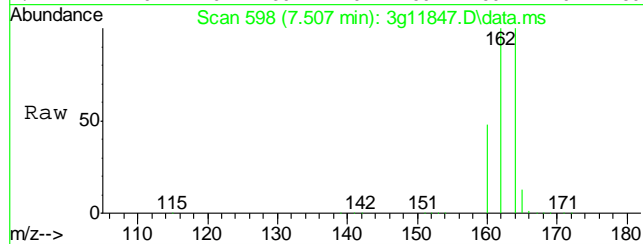
Tgt Ion: 152 Resp: 121  
Ion Ratio Lower Upper  
152 100  
151 109.1 0.0 39.6#  
153 17.4 0.0 33.0





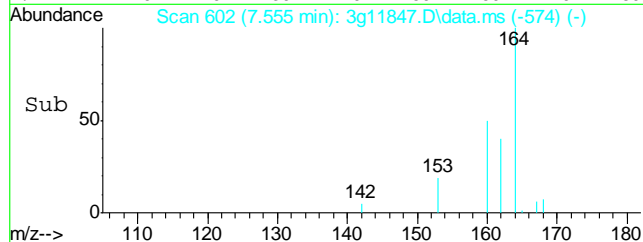
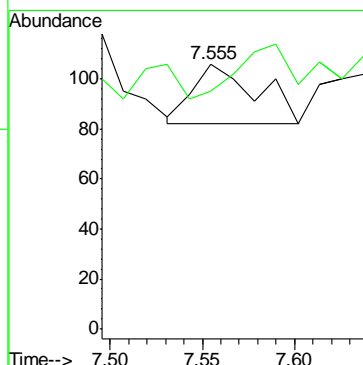
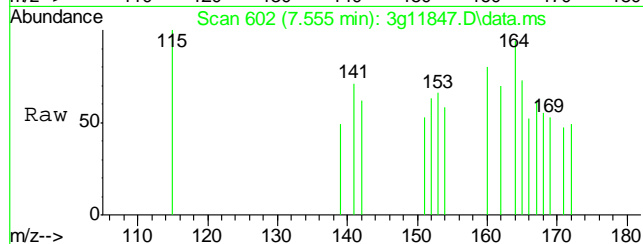
#11  
Acenaphthene  
Concen: Below ug/mL  
RT: 7.507 min Scan# 598  
Delta R.T. -0.035 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

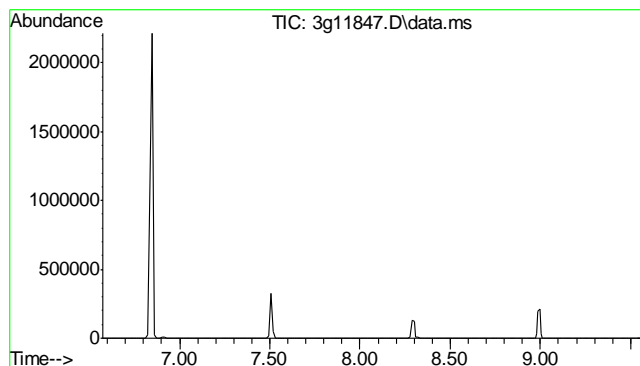
Tgt Ion:154 Resp: 615  
Ion Ratio Lower Upper  
154 100  
153 7.8 83.1 123.1#  
152 8.9 29.1 69.1#



#12  
Dibenzofuran  
Concen: Below ug/mL  
RT: 7.555 min Scan# 602  
Delta R.T. -0.165 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

Tgt Ion:168 Resp: 57  
Ion Ratio Lower Upper  
168 100  
139 52.6 14.1 54.1

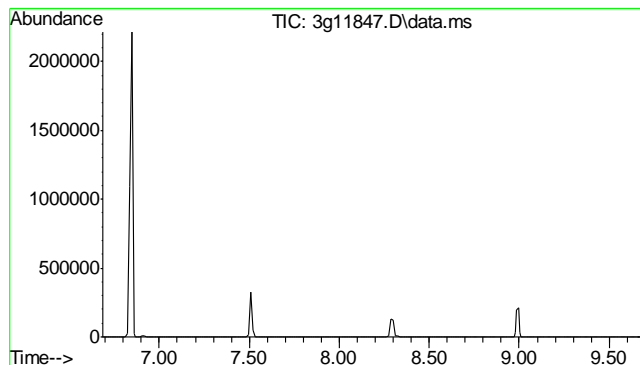
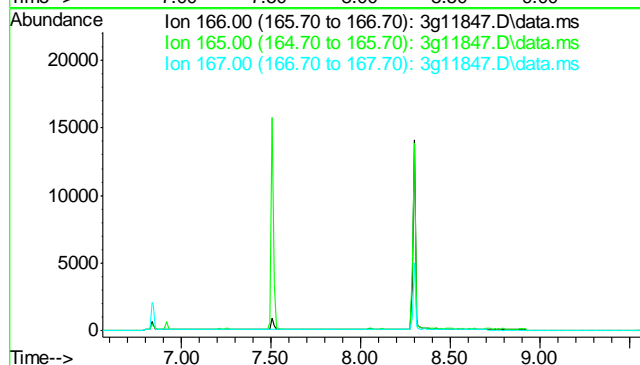




#13  
Fluorene  
Concen: N.D. ug/mL  
Expected RT: 8.06 min

Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

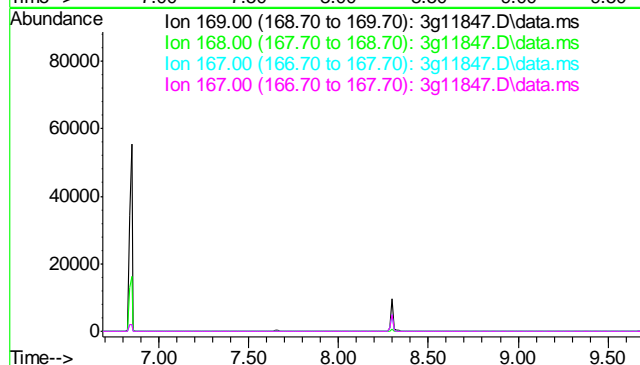
Tgt Ion:	166
Sig	Exp Ratio
166	100
165	92.9
167	13.2

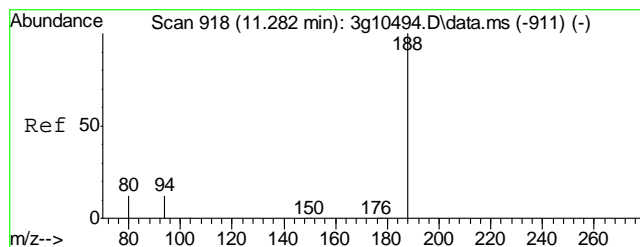


#14  
Diphenylamine  
Concen: N.D. ug/mL  
Expected RT: 8.18 min

Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

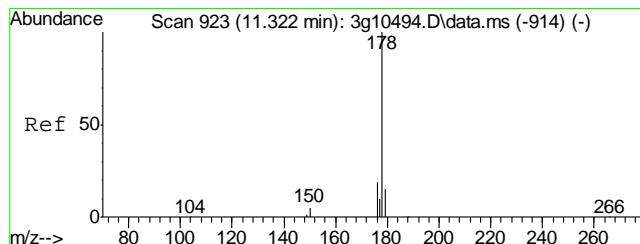
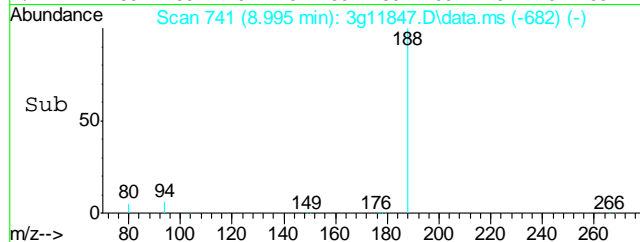
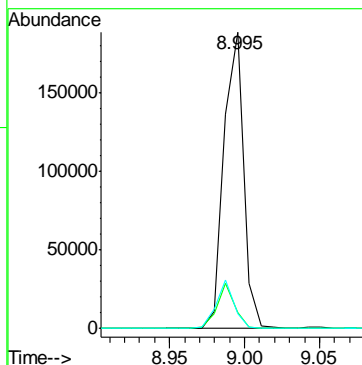
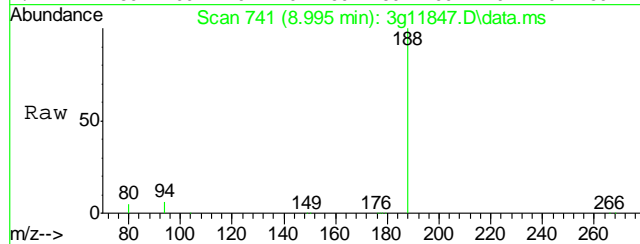
Tgt Ion:	169
Sig	Exp Ratio
169	100
168	62.0
167	34.1
167	34.1





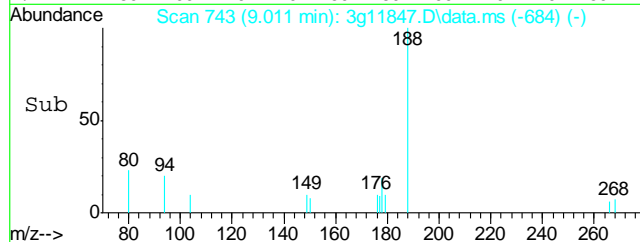
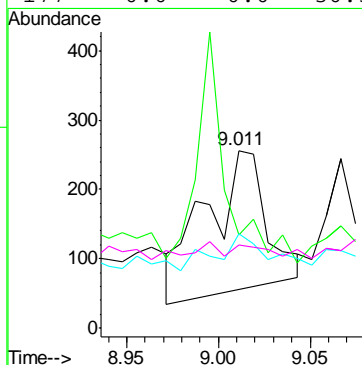
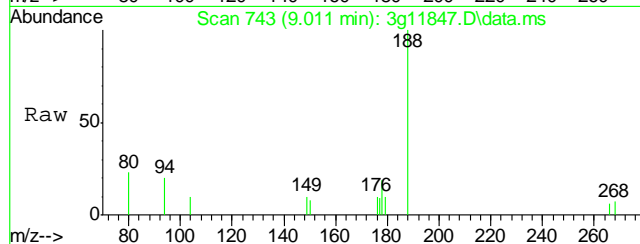
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 8.995 min Scan# 741  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

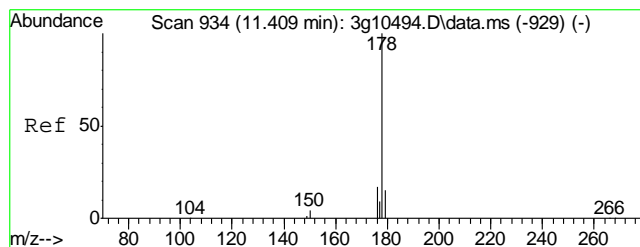
Tgt Ion	Ratio	Lower	Upper
188	100		
94	13.4	0.0	33.4
80	14.7	0.0	34.7



#16  
Phenanthrene  
Concen: Below ug/mL  
RT: 9.011 min Scan# 743  
Delta R.T. -0.008 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

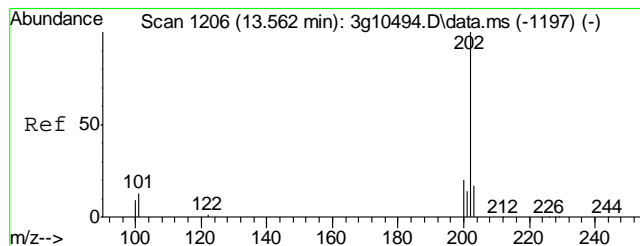
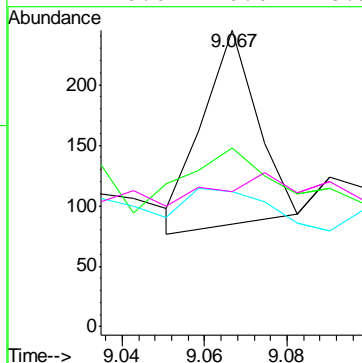
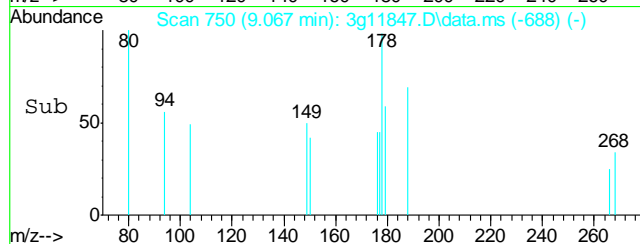
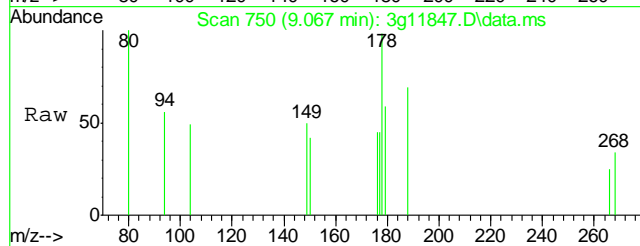
Tgt Ion	Ratio	Lower	Upper
178	100		
179	114.7	0.0	35.2#
176	0.0	0.0	38.9
177	0.0	0.0	30.3





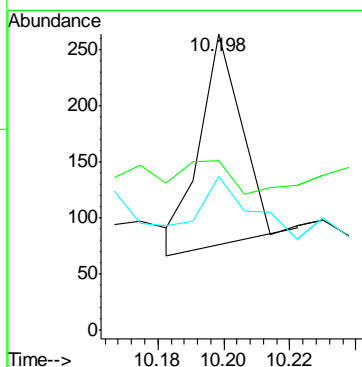
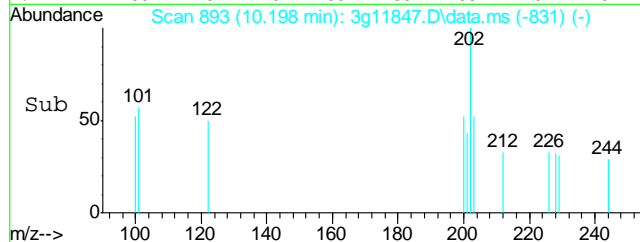
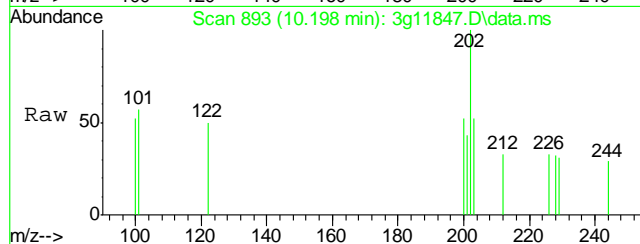
#17  
Anthracene  
Concen: Below ug/mL  
RT: 9.067 min Scan# 750  
Delta R.T. -0.008 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

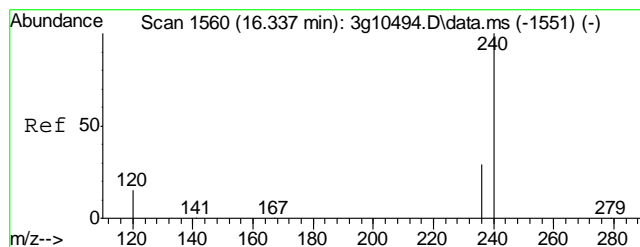
Tgt Ion: 178 Resp: 149  
Ion Ratio Lower Upper  
178 100  
179 61.1 0.0 35.1#  
176 31.5 0.0 38.3  
177 0.0 0.0 28.9



#18  
Fluoranthene  
Concen: Below ug/mL  
RT: 10.198 min Scan# 893  
Delta R.T. -0.008 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

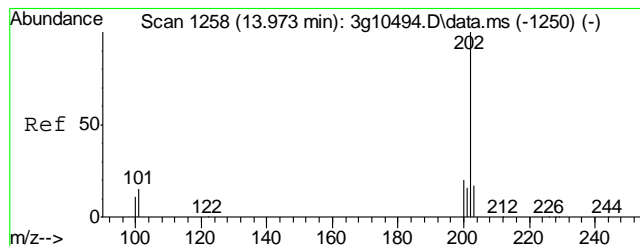
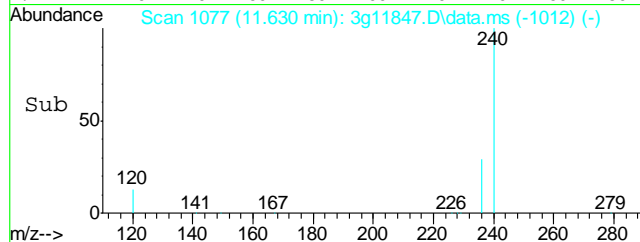
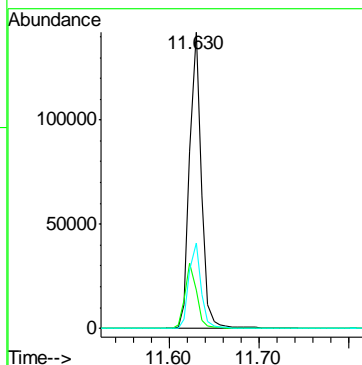
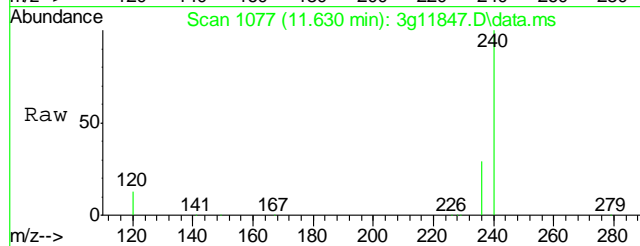
Tgt Ion: 202 Resp: 169  
Ion Ratio Lower Upper  
202 100  
101 0.0 0.0 33.9  
203 33.7 0.0 37.2





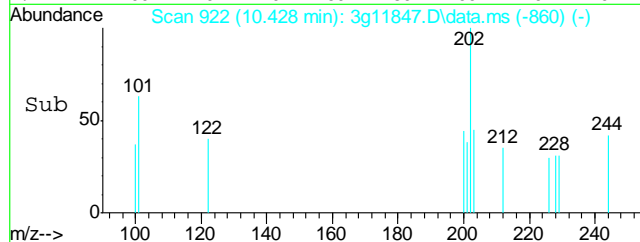
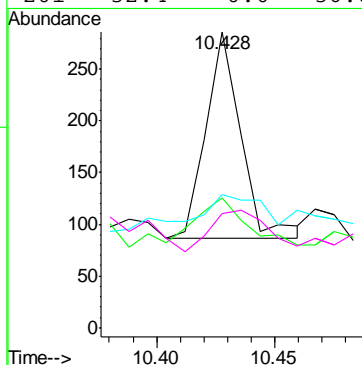
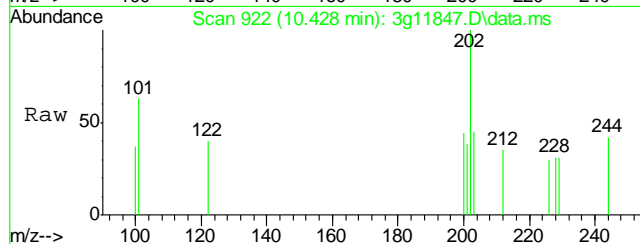
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.630 min Scan# 1077  
Delta R.T. -0.007 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

Tgt Ion:	240	Resp:	127938
Ion Ratio	Lower	Upper	
240	100		
120	21.8	1.4	41.4
236	29.6	9.7	49.7

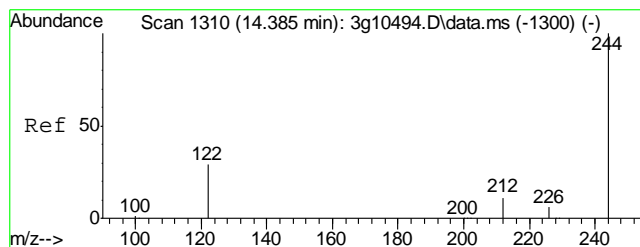


#20  
Pyrene  
Concen: Below ug/mL  
RT: 10.428 min Scan# 922  
Delta R.T. -0.008 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

Tgt Ion:	202	Resp:	204
Ion Ratio	Lower	Upper	
202	100		
200	0.0	0.8	40.8#
203	0.0	0.0	37.9
201	32.4	0.0	36.8

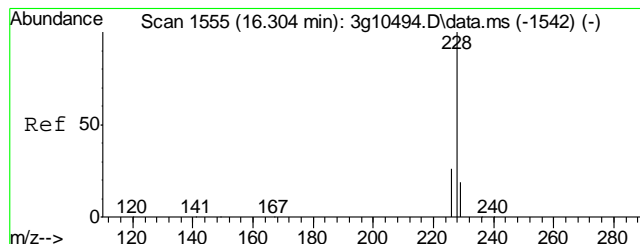
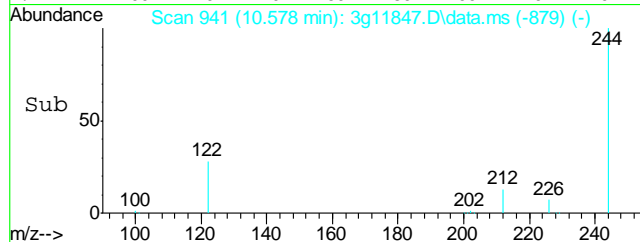
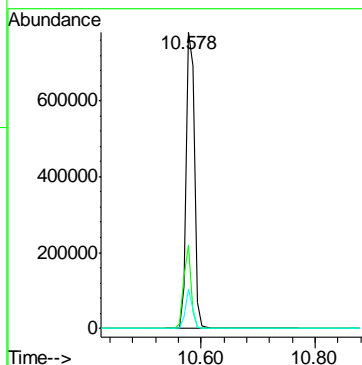
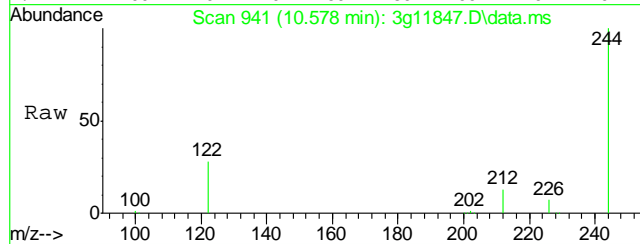






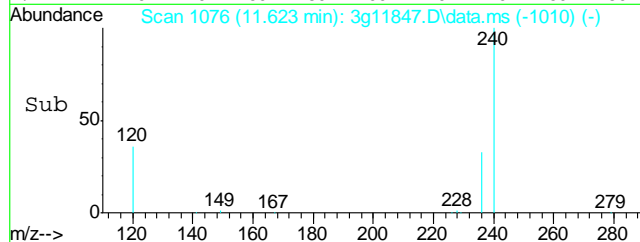
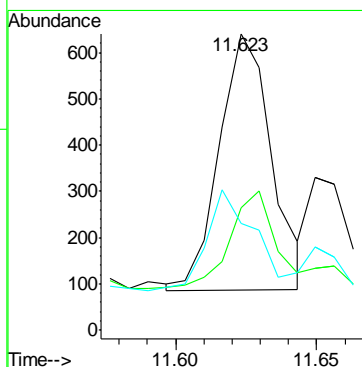
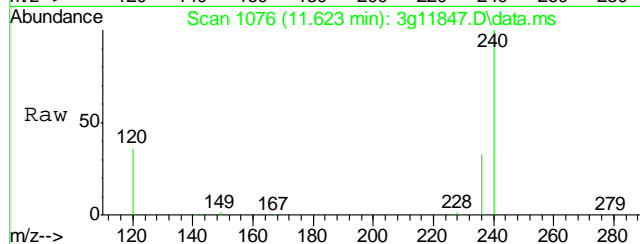
#21  
Terphenyl-d14  
Concen: 43.5682 ug/mL  
RT: 10.578 min Scan# 941  
Delta R.T. -0.008 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

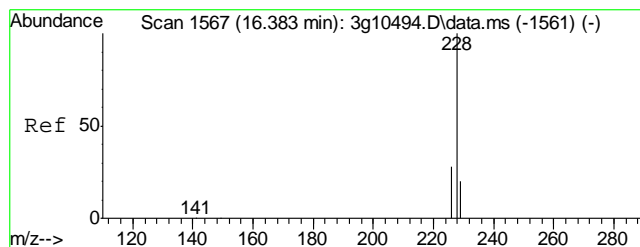
Tgt Ion:	244	Resp:	792729
Ion Ratio	Lower	Upper	
244	100		
122	25.1	6.6	46.6
212	11.4	0.0	31.7



#22  
Benzo(a)anthracene  
Concen: Below ug/mL  
RT: 11.623 min Scan# 1076  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

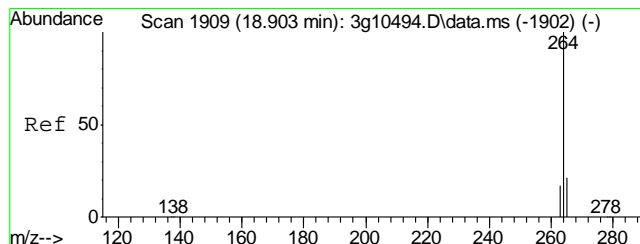
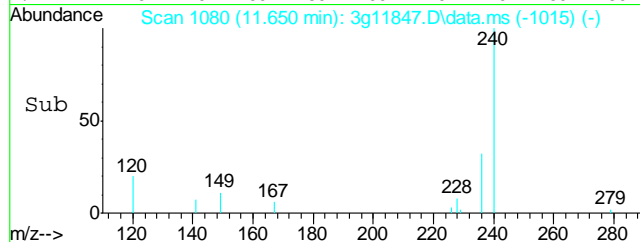
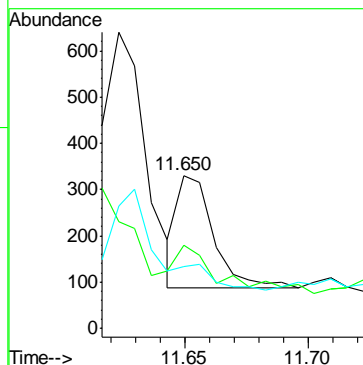
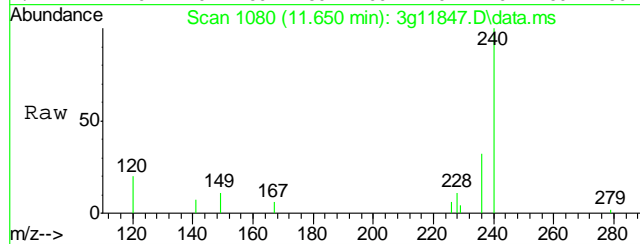
Tgt Ion:	228	Resp:	718
Ion Ratio	Lower	Upper	
228	100		
229	46.5	0.0	39.5#
226	37.7	7.1	47.1





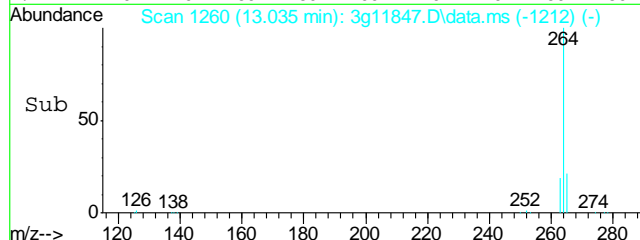
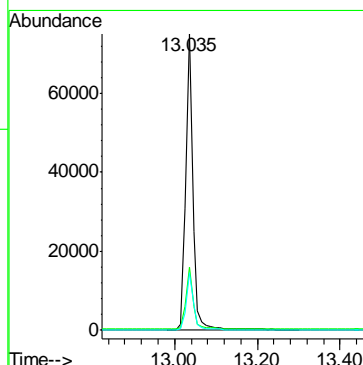
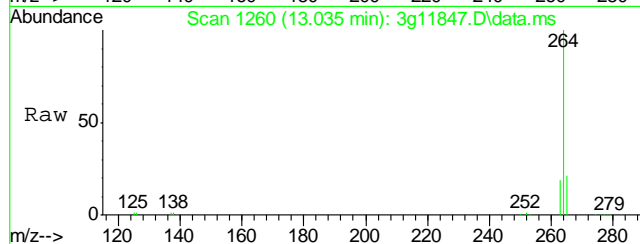
#23  
Chrysene  
Concen: Below ug/mL  
RT: 11.650 min Scan# 1080  
Delta R.T. -0.013 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

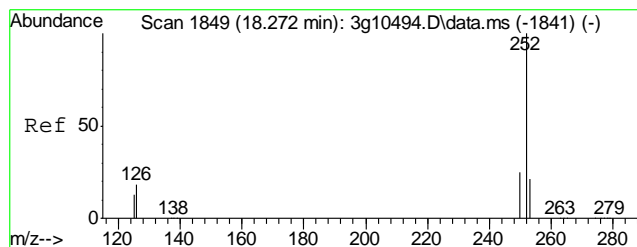
Tgt Ion: 228	Resp: 249
Ion Ratio	Lower Upper
228	100
226	50.6 9.6 49.6#
229	0.0 0.0 39.3



#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 13.035 min Scan# 1260  
Delta R.T. 0.000 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

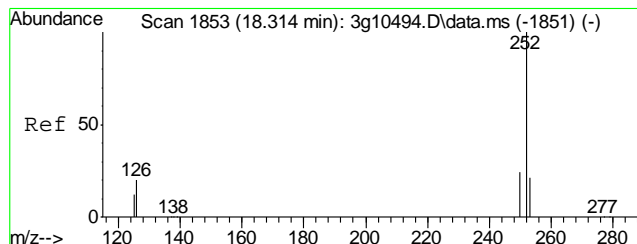
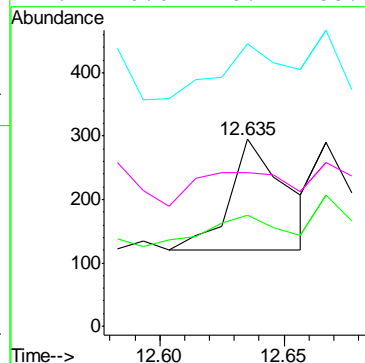
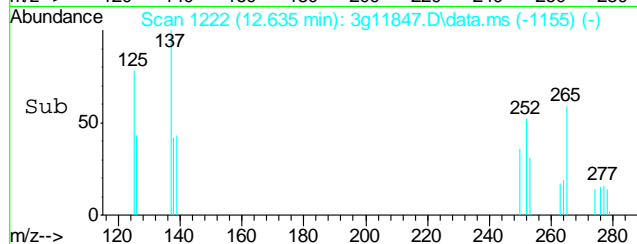
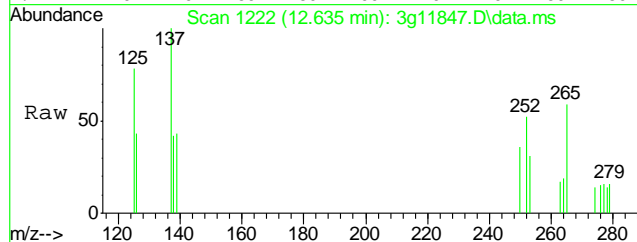
Tgt Ion: 264	Resp: 90622
Ion Ratio	Lower Upper
264	100
265	20.8 1.2 41.2
263	19.3 0.0 39.6





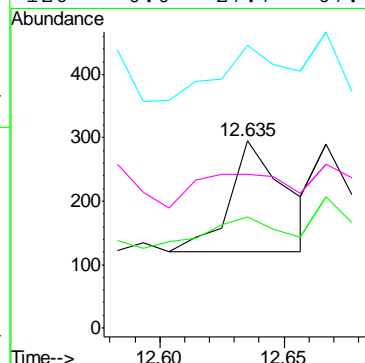
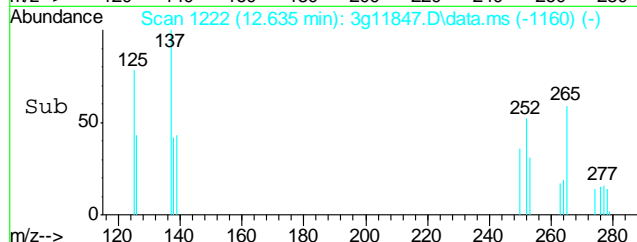
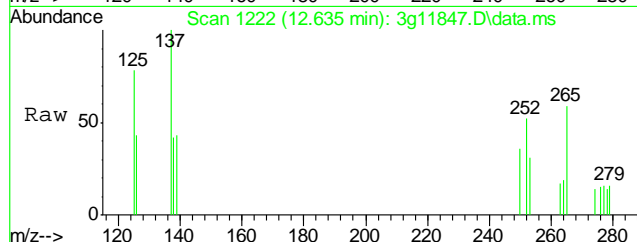
#25  
Benzo(b)fluoranthene  
Concen: Below ug/mL  
RT: 12.635 min Scan# 1222  
Delta R.T. -0.011 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

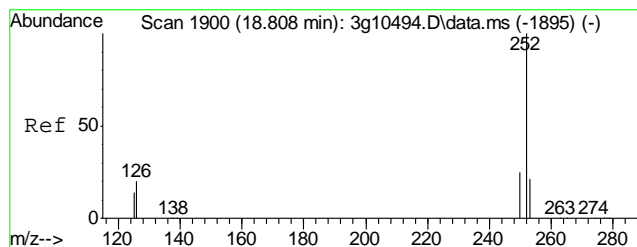
Tgt Ion	Ratio	Lower	Upper
252	100		
253	43.8	1.0	41.0#
125	0.0	6.5	46.5#
126	0.0	18.4	58.4#



#26  
Benzo(k)fluoranthene  
Concen: Below ug/mL  
RT: 12.635 min Scan# 1222  
Delta R.T. -0.042 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

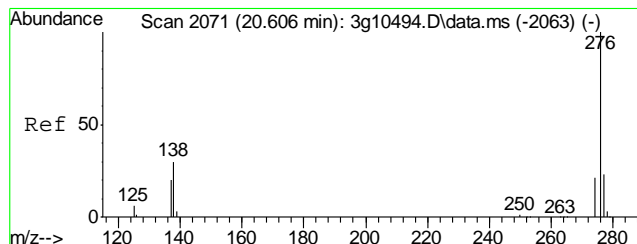
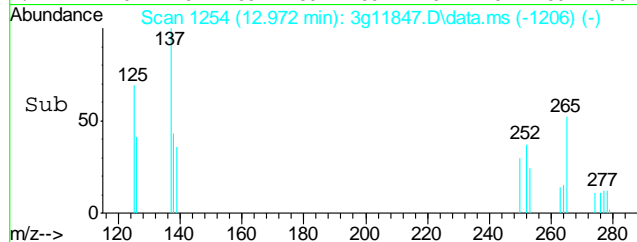
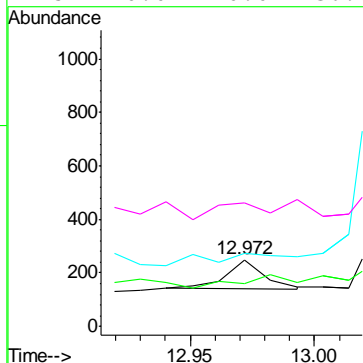
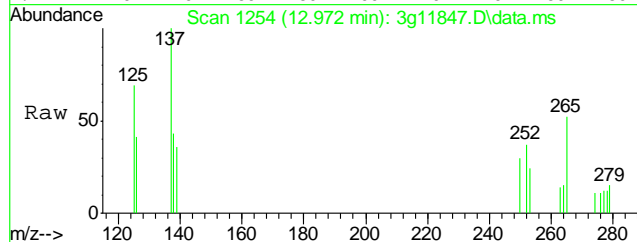
Tgt Ion	Ratio	Lower	Upper
252	100		
253	43.8	6.1	46.1
125	0.0	12.9	52.9#
126	0.0	27.7	67.7#





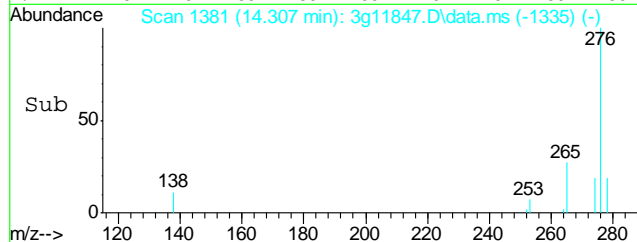
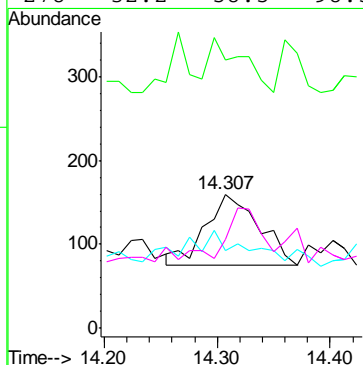
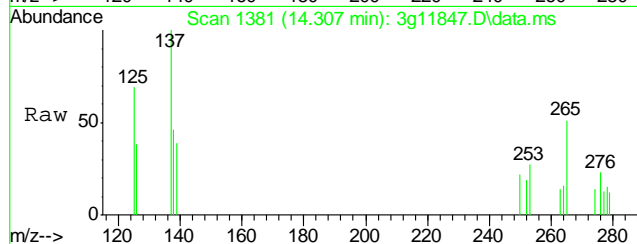
#27  
Benzo(a)pyrene  
Concen: Below ug/mL  
RT: 12.972 min Scan# 1254  
Delta R.T. -0.010 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

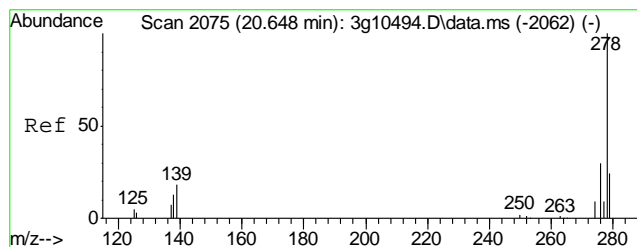
Tgt Ion	Ratio	Lower	Upper
252	100		
253	0.0	1.7	41.7#
126	0.0	1.5	41.5#
125	0.0	0.0	36.0



#28  
Indeno(1,2,3-cd)pyrene  
Concen: Below ug/mL  
RT: 14.307 min Scan# 1381  
Delta R.T. -0.021 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

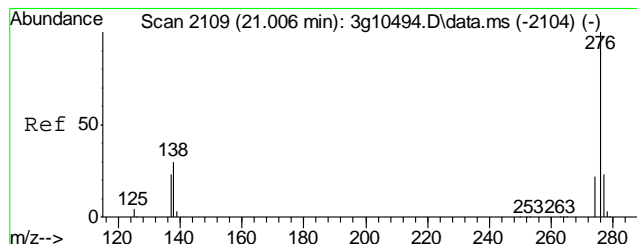
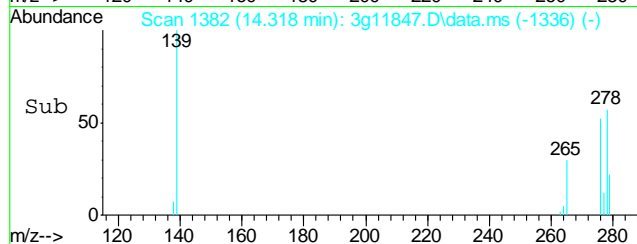
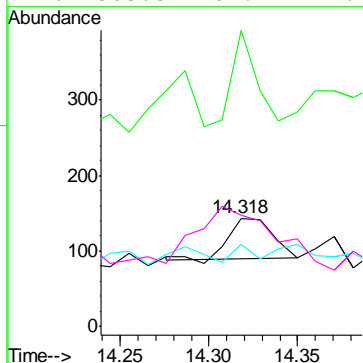
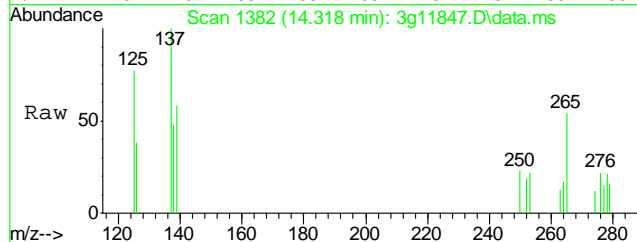
Tgt Ion	Ratio	Lower	Upper
276	100		
138	47.5	24.2	64.2
277	46.7	5.0	45.0#
278	32.2	58.5	98.5#





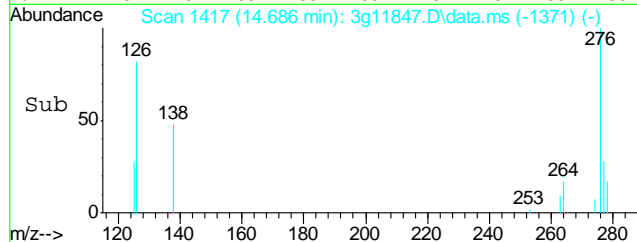
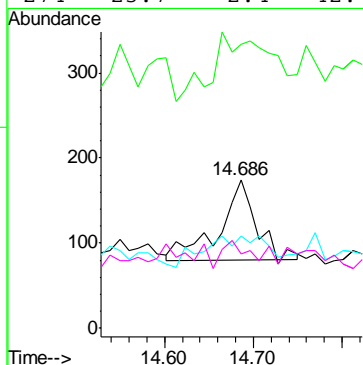
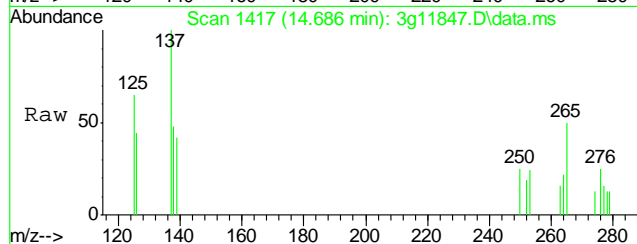
#29  
Dibenz(a,h)anthracene  
Concen: Below ug/mL  
RT: 14.318 min Scan# 1382  
Delta R.T. -0.021 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

Tgt Ion: 278 Resp: 91  
Ion Ratio Lower Upper  
278 100  
139 133.0 13.5 53.5#  
279 60.4 3.1 43.1#  
276 303.3 107.4 147.4#



#30  
Benzo(g,h,i)perylene  
Concen: Below ug/mL  
RT: 14.686 min Scan# 1417  
Delta R.T. -0.021 min  
Lab File: 3g11847.D  
Acq: 31 Oct 12 5:50 pm

Tgt Ion: 276 Resp: 278  
Ion Ratio Lower Upper  
276 100  
138 45.7 18.4 58.4  
277 32.7 3.6 43.6  
274 23.7 2.4 42.4



## 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: D40328  
Account: XTOKRWR XTO Energy  
Project: PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB998-MB	GB18246.D	1	10/29/12	SK	n/a	n/a	GGB998

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

D40328-1

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	93% 60-140%

10.1.1  
10

Blank Spike Summary

Job Number: D40328  
Account: XTOKRWR XTO Energy  
Project: PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB998-BS	GB18247.D	1	10/29/12	SK	n/a	n/a	GGB998

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

D40328-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	124	113	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	107%	60-140%

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D40315-1MS	GB18249.D	1	10/29/12	SK	n/a	n/a	GGB998
D40315-1MSD	GB18250.D	1	10/29/12	SK	n/a	n/a	GGB998
D40315-1	GB18248.D	1	10/29/12	SK	n/a	n/a	GGB998

The QC reported here applies to the following samples:

Method: SW846 8015B

D40328-1

CAS No.	Compound	D40315-1 mg/kg	Spike Q	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	130	146	112	145	111	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D40315-1	Limits
120-82-1	1,2,4-Trichlorobenzene	104%	104%	96%	60-140%

\* = Outside of Control Limits.

GC Volatiles

Raw Data



Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\102912\GB18265.D\FID1A.CH Vial: 22  
Signal #2 : Y:\1\DATA\102912\GB18265.D\FID2B.CH  
Acq On : 29 Oct 2012 10:11 pm Operator: StephK  
Sample : D40328-1, 50X Inst : GC/MS Ins  
Misc : GC3204,GGB998,5.050,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Oct 30 09:14:10 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Mon Oct 29 11:06:08 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

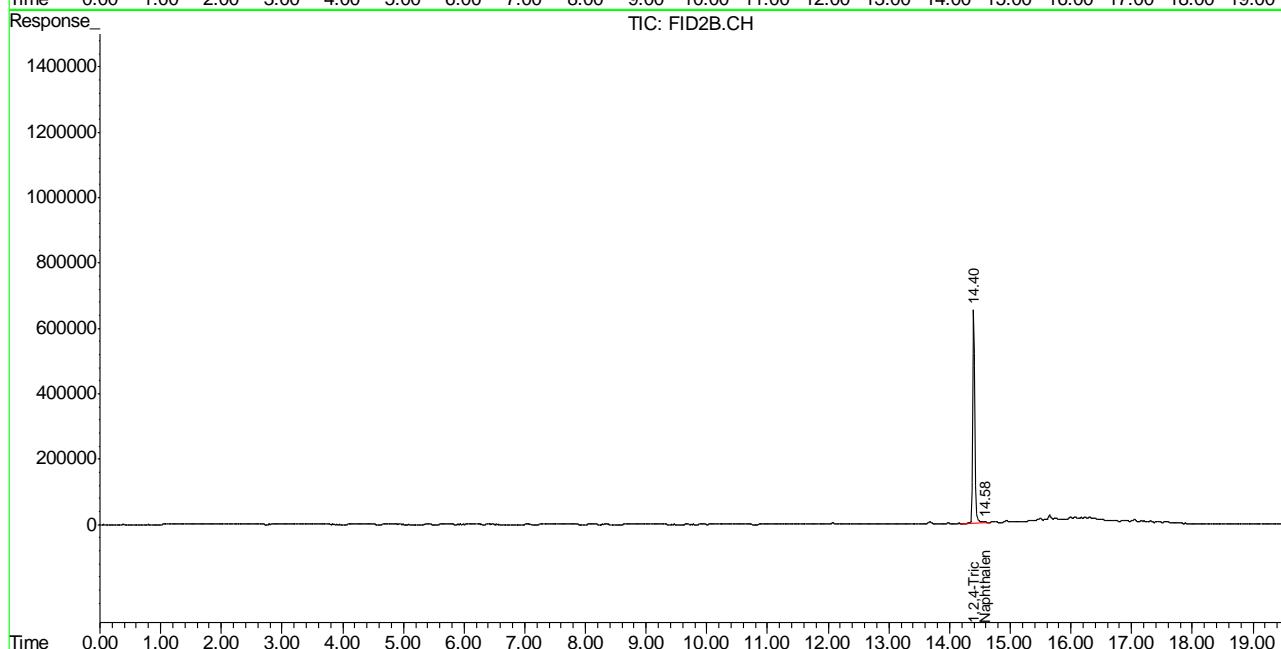
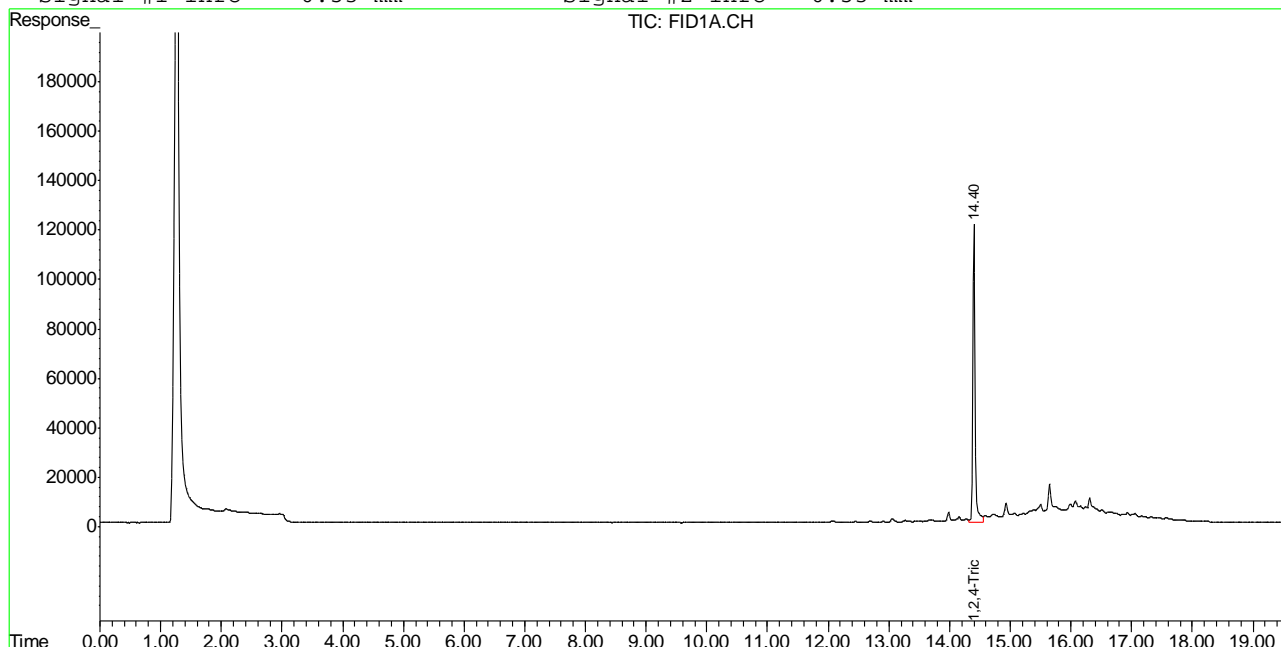
Compound	R.T.	Response	Conc	Units
-----				
System Monitoring Compounds				
2) S 1,2,4-Trichlorobenzene	14.40	3025702	96.563 %	m
10) S 1,2,4-Trichlorobenzene (P)	14.40	15505978	95.405 %	
Target Compounds				
1) H TVH-Gasoline	7.23	3595142	<MDL	mg/L
4) T Methyl-t-butyl-ether	0.00	0	N.D.	ug/L d
5) T Benzene	0.00	0	N.D.	ug/L d
6) T Toluene	0.00	0	N.D.	ug/L d
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	14.58	145300	0.736	ug/L

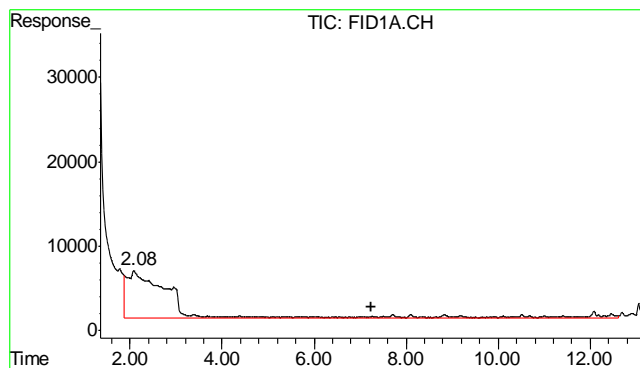
Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\102912\GB18265.D\FID1A.CH Vial: 22  
 Signal #2 : Y:\1\DATA\102912\GB18265.D\FID2B.CH  
 Acq On : 29 Oct 2012 10:11 pm Operator: StephK  
 Sample : D40328-1, 50X Inst : GC/MS Ins  
 Misc : GC3204,GGB998,5.050,,100,5,1 Multiplr: 1.00  
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
 Quant Time: Oct 30 9:27 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
 Title : 8015B/8021B TVH/BTEX  
 Last Update : Mon Oct 29 11:06:08 2012  
 Response via : Multiple Level Calibration  
 DataAcq Meth : TVB4.M

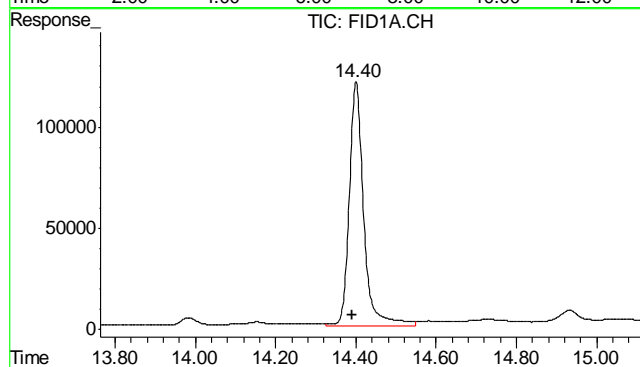
Volume Inj. :  
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





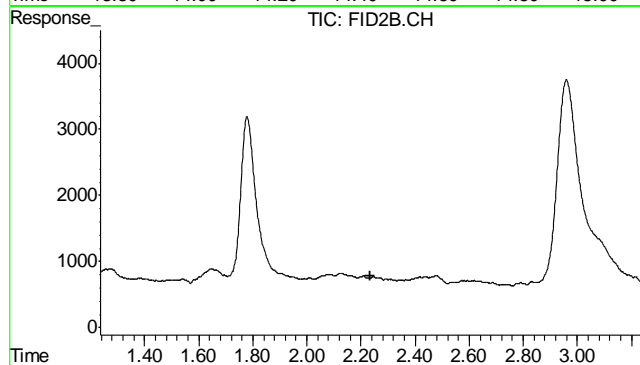
#1 TVH-Gasoline

R.T.: 7.230 min  
Delta R.T.: 0.000 min  
Response: 3595142  
Conc: N.D.



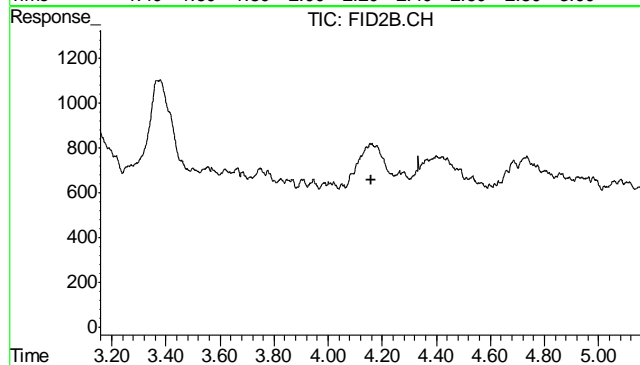
#2 1,2,4-Trichlorobenzene

R.T.: 14.400 min  
Delta R.T.: 0.010 min  
Response: 3025702  
Conc: 96.56 % m



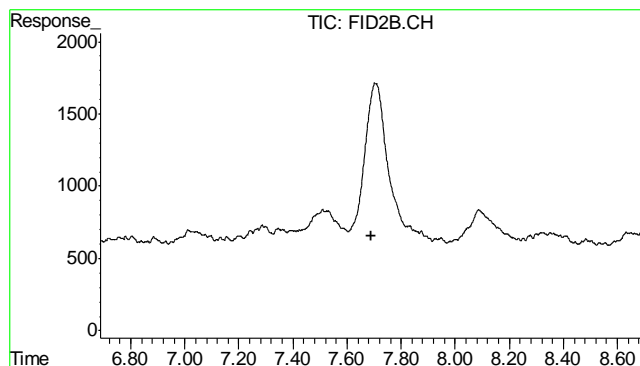
#4 Methyl-t-butyl-ether

R.T.: 0.000 min  
Exp R.T.: 2.236 min  
Response: 0  
Conc: N.D.

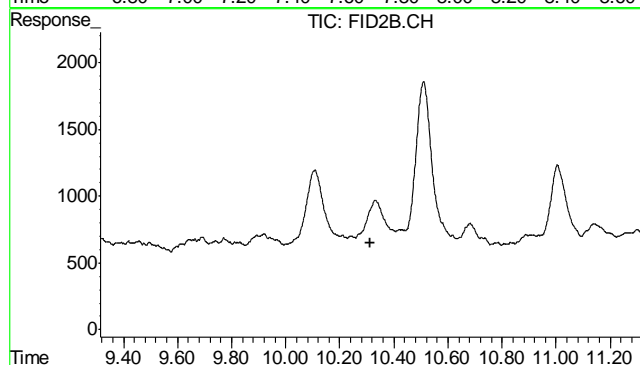


#5 Benzene

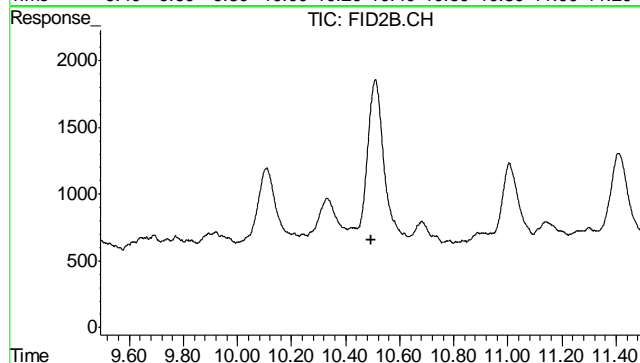
R.T.: 0.000 min  
Exp R.T.: 4.158 min  
Response: 0  
Conc: N.D.



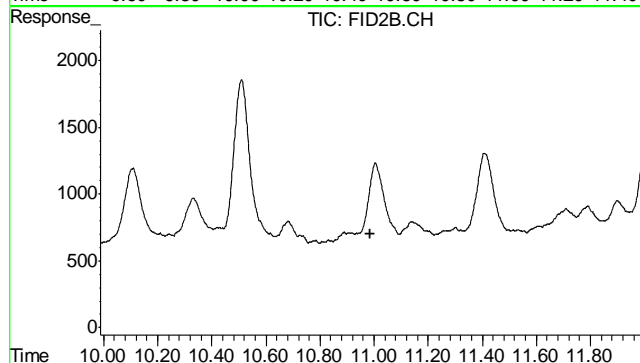
#6 Toluene  
 R.T.: 0.000 min  
 Exp R.T. : 7.688 min  
 Response: 0  
 Conc: N.D.



#7 Ethylbenzene  
 R.T.: 0.000 min  
 Exp R.T. : 10.314 min  
 Response: 0  
 Conc: N.D.

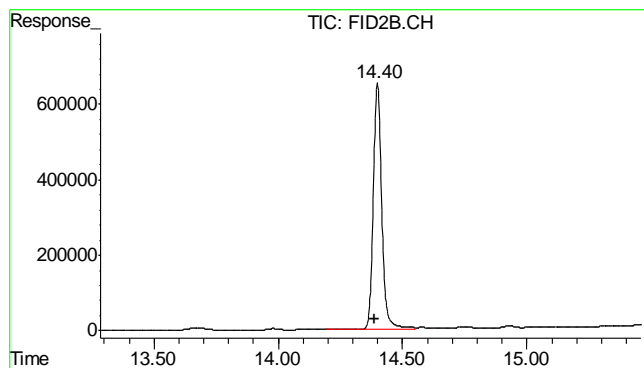


#8 m,p-Xylene  
 R.T.: 0.000 min  
 Exp R.T. : 10.493 min  
 Response: 0  
 Conc: N.D.



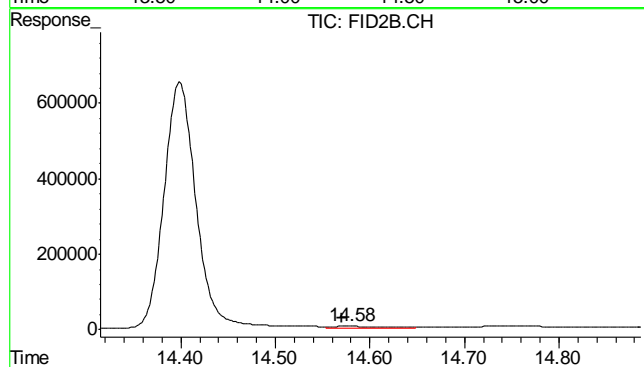
#9 o-Xylene  
 R.T.: 0.000 min  
 Exp R.T. : 10.987 min  
 Response: 0  
 Conc: N.D.

11.11



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

R.T.: 14.399 min  
 Delta R.T.: 0.010 min  
 Response: 15505978  
 Conc: 95.41 %



#11 Naphthalene

R.T.: 14.578 min  
 Delta R.T.: 0.008 min  
 Response: 145300  
 Conc: 0.74 ug/L

11.1.1  
11

## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\102912\GB18246.D\FID1A.CH Vial: 3  
Signal #2 : Y:\1\DATA\102912\GB18246.D\FID2B.CH  
Acq On : 29 Oct 2012 10:57 am Operator: StephK  
Sample : MB Inst : GC/MS Ins  
Misc : GC3204,GGB998,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Oct 29 11:07:48 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Mon Oct 29 11:06:08 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	14.42	2898612	92.507	%
10) S	1,2,4-Trichlorobenzene (P)	14.42	15830092	97.399	%
Target Compounds					
1) H	TVH-Gasoline	7.23	3656743	<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	7.73	84357	0.213	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	14.60	214066	1.085	ug/L

-----  
(f)=RT Delta > 1/2 Window (m)=manual int.  
GB18246.D TB868GB868SOIL.M Tue Oct 30 09:20:42 2012 GC

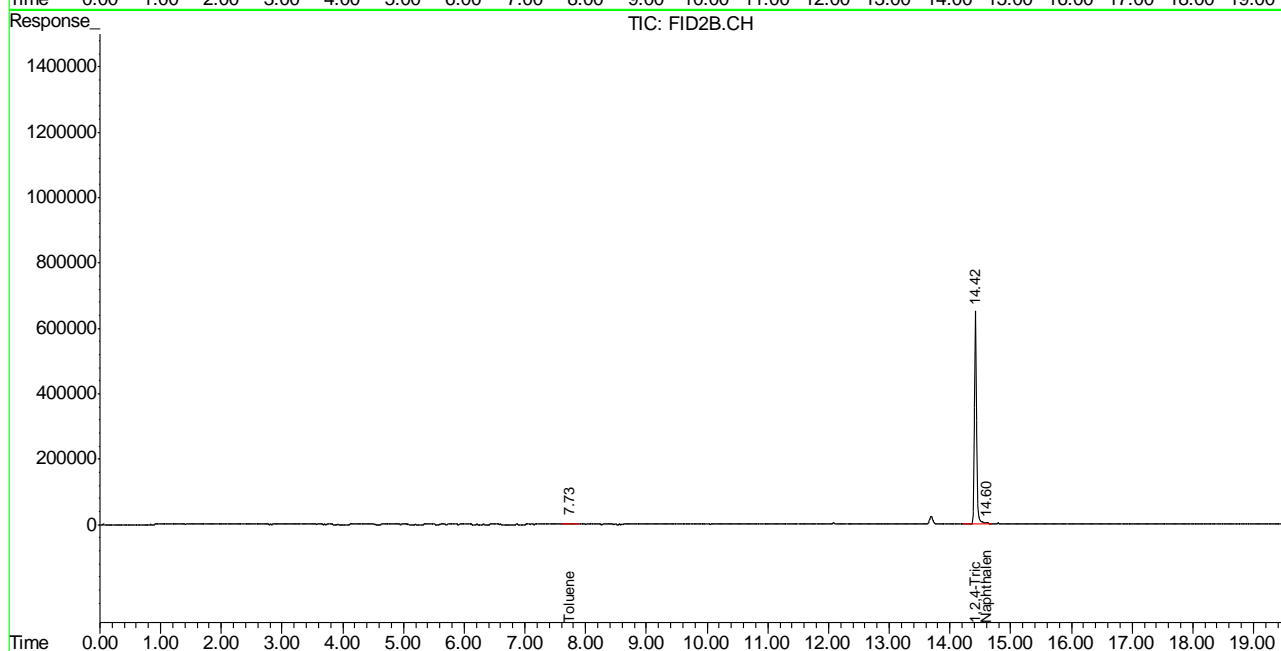
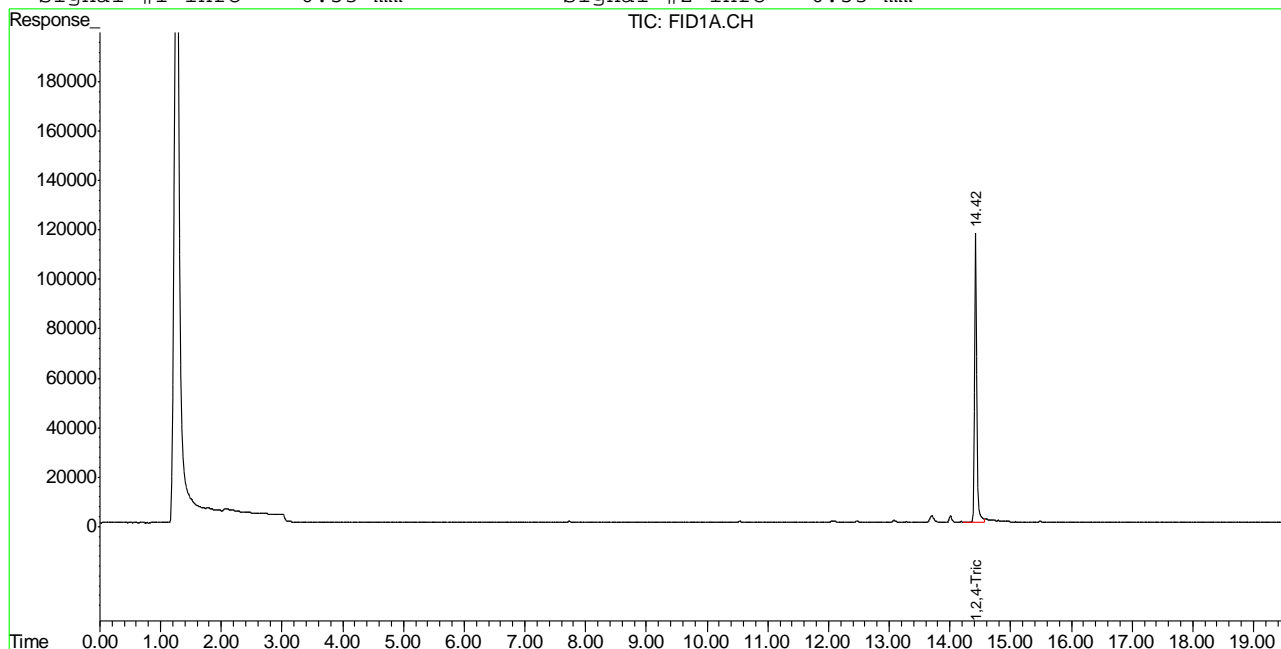


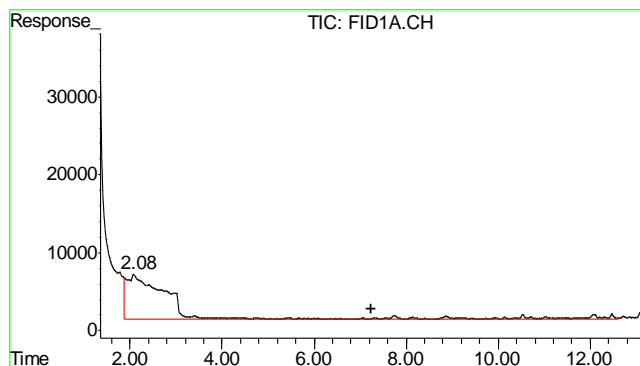
## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\102912\GB18246.D\FID1A.CH Vial: 3  
Signal #2 : Y:\1\DATA\102912\GB18246.D\FID2B.CH  
Acq On : 29 Oct 2012 10:57 am Operator: StephK  
Sample : MB Inst : GC/MS Ins  
Misc : GC3204,GGB998,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Oct 29 11:17 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Mon Oct 29 11:06:08 2012  
Response via : Multiple Level Calibration  
DataAcq Meth : TVB4.M

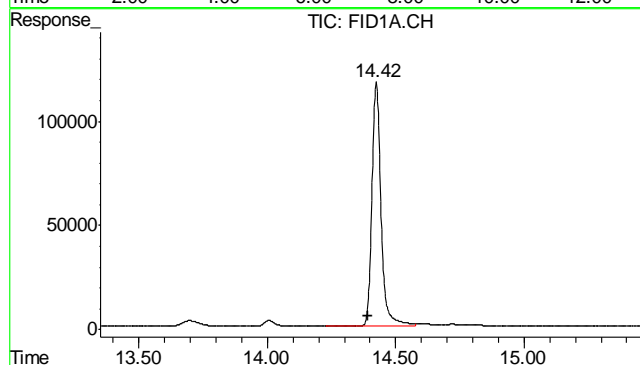
Volume Inj. :  
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





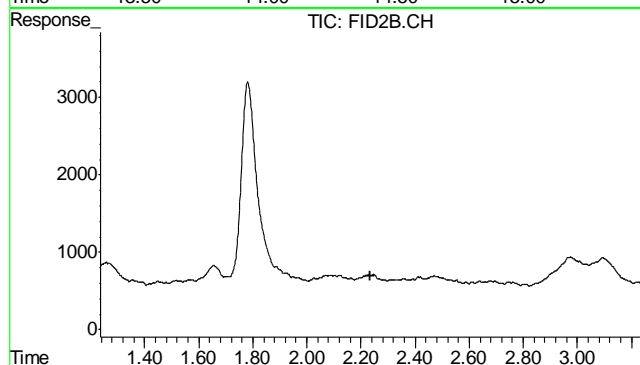
#1 TVH-Gasoline

R.T.: 7.230 min  
Delta R.T.: 0.000 min  
Response: 3656743  
Conc: N.D.



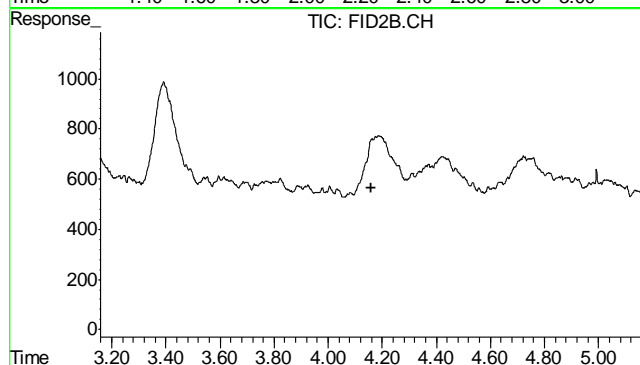
#2 1,2,4-Trichlorobenzene

R.T.: 14.425 min  
Delta R.T.: 0.034 min  
Response: 2898612  
Conc: 92.51 %



#4 Methyl-t-butyl-ether

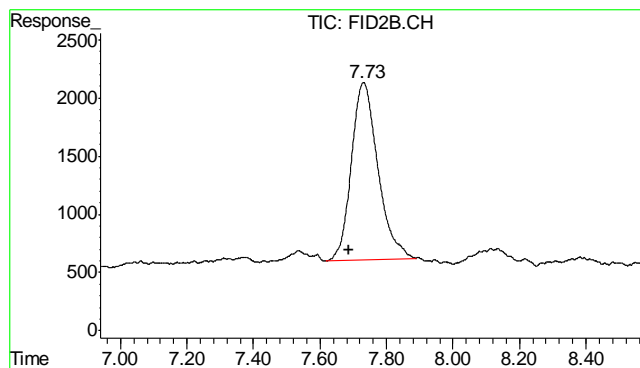
R.T.: 0.000 min  
Exp R.T.: 2.236 min  
Response: 0  
Conc: N.D.



#5 Benzene

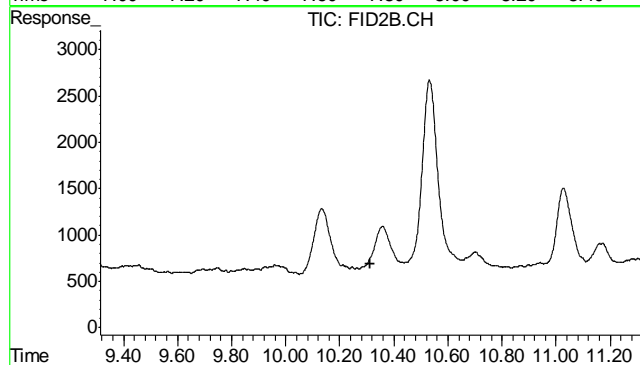
R.T.: 0.000 min  
Exp R.T.: 4.158 min  
Response: 0  
Conc: N.D.

11.21  
11



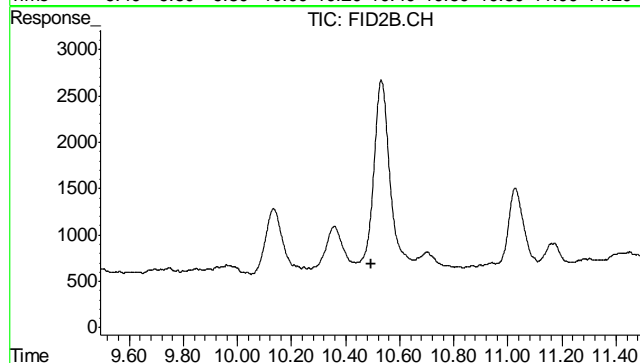
#6 Toluene

R.T.: 7.732 min  
Delta R.T.: 0.044 min  
Response: 84357  
Conc: 0.21 ug/L



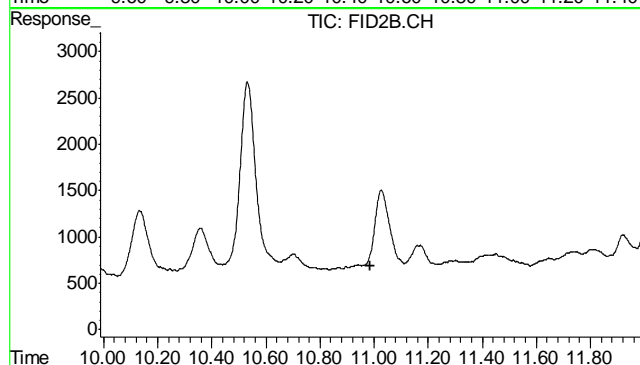
#7 Ethylbenzene

R.T.: 0.000 min  
Exp R.T. : 10.314 min  
Response: 0  
Conc: N.D.



#8 m,p-Xylene

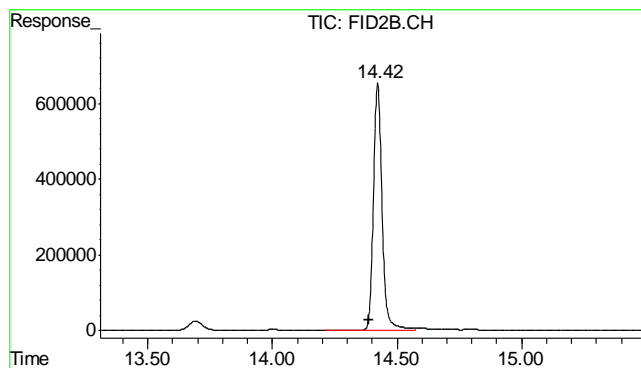
R.T.: 0.000 min  
Exp R.T. : 10.493 min  
Response: 0  
Conc: N.D.



#9 o-Xylene

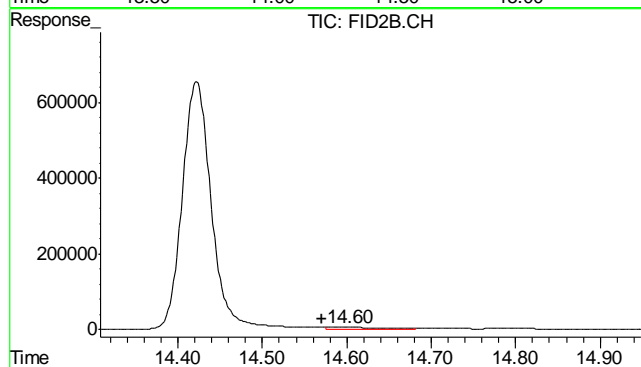
R.T.: 0.000 min  
Exp R.T. : 10.987 min  
Response: 0  
Conc: N.D.

11.21  
11



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

R.T.: 14.422 min  
Delta R.T.: 0.034 min  
Response: 15830092  
Conc: 97.40 %



#11 Naphthalene

R.T.: 14.602 min  
Delta R.T.: 0.031 min  
Response: 214066  
Conc: 1.08 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**

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6873-MB	FD19014.D	1	10/30/12	AV	10/29/12	OP6873	GFD960

The QC reported here applies to the following samples:

Method: SW846-8015B

D40328-1

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	92% 43-136%

12.1.1  
12

## Blank Spike Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6873-BS	FD19015.D	1	10/30/12	AV	10/29/12	OP6873	GFD960

The QC reported here applies to the following samples:

Method: SW846-8015B

D40328-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	624	94	58-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	92%	43-136%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D40328  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6873-MS	FD19016.D	1	10/30/12	AV	10/29/12	OP6873	GFD960
OP6873-MSD	FD19017.D	1	10/30/12	AV	10/29/12	OP6873	GFD960
D40313-4	FD19021.D	1	10/30/12	AV	10/29/12	OP6873	GFD960

The QC reported here applies to the following samples:

Method: SW846-8015B

D40328-1

CAS No.	Compound	D40313-4 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	2380	741	2980	81	2770	53	7	20-183/43

CAS No.	Surrogate Recoveries	MS	MSD	D40313-4	Limits
84-15-1	o-Terphenyl	68%	68%	76%	43-136%

\* = Outside of Control Limits.



GC Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102912\FD19027.D Vial: 40  
Acq On : 10-30-2012 09:58:34 AM Operator: ashleyv  
Sample : D40328-1 Inst : FID5  
Misc : OP6873,GFD960,30.05,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Oct 30 10:50:38 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Mon Oct 22 10:08:28 2012  
Response via : Initial Calibration  
DataAcq Meth : DRO\_FR.M

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

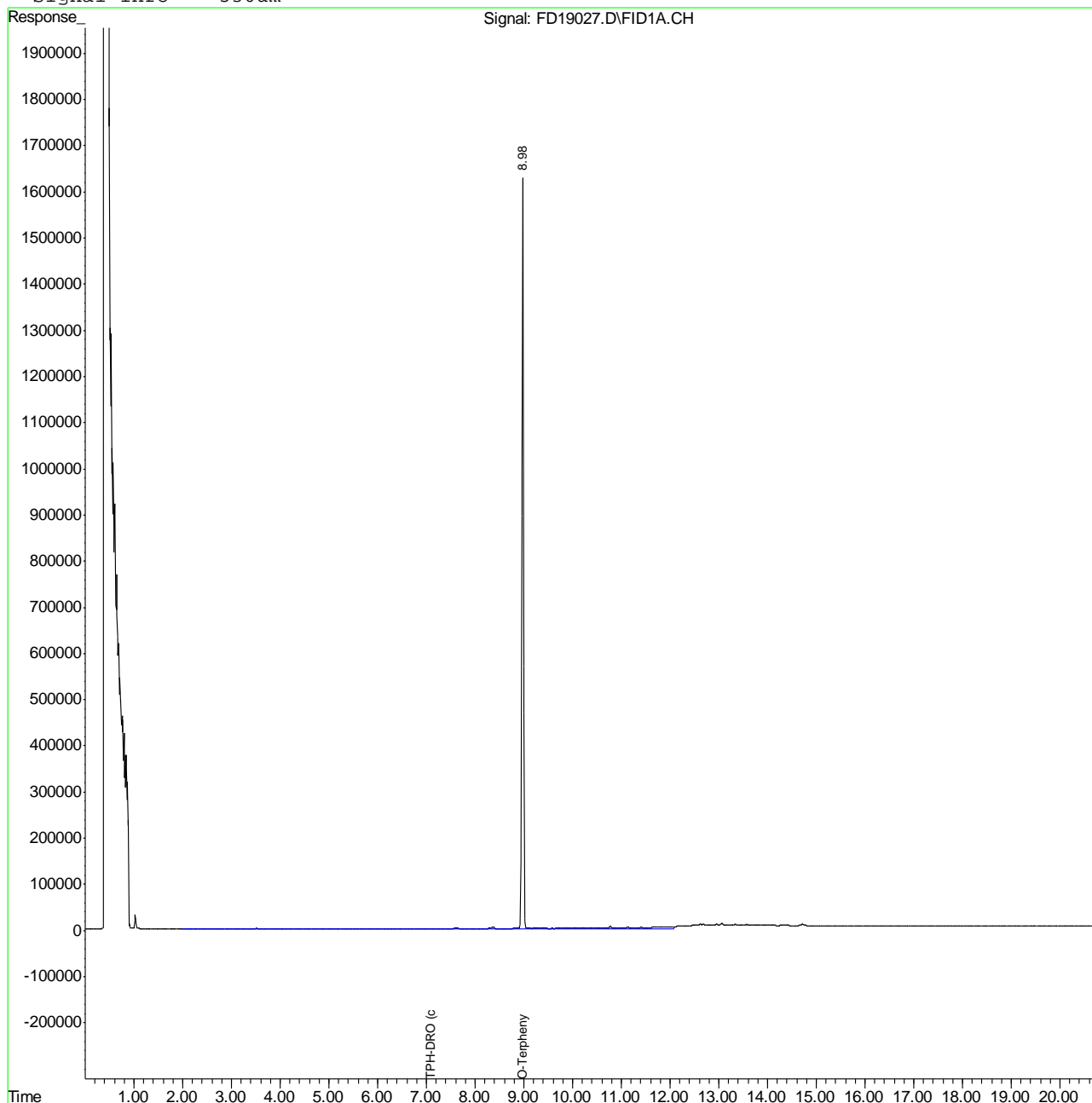
Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	8.98	37803565	800.270 mg/L
Target Compounds			
2) H TPH-DRO (c10-c28)	7.08	4904288	127.367 mg/L

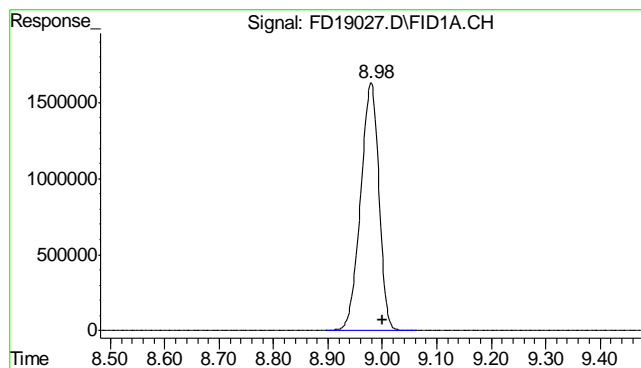
Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102912\FD19027.D Vial: 40  
 Acq On : 10-30-2012 09:58:34 AM Operator: ashleyv  
 Sample : D40328-1 Inst : FID5  
 Misc : OP6873,GFD960,30.05,,,2,1 Multiplr: 1.00  
 IntFile : autoint1.e  
 Quant Time: Oct 30 11:28 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
 Title : 8015B TEH  
 Last Update : Mon Oct 22 10:08:28 2012  
 Response via : Multiple Level Calibration  
 DataAcq Meth : DRO\_FR.M

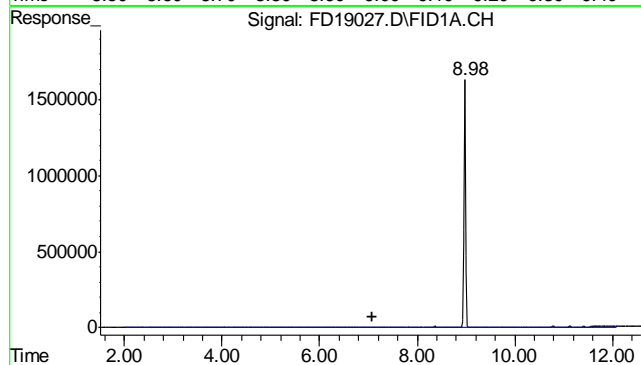
Volume Inj. : 1ul  
 Signal Phase : RTX-5  
 Signal Info : 530um





#1 O-Terphenyl

R.T.: 8.979 min  
 Delta R.T.: -0.021 min  
 Response: 37803565  
 Conc: 800.27 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 7.075 min  
 Delta R.T.: 0.000 min  
 Response: 4904288  
 Conc: 127.37 mg/L m

13.1.1  
 13

## Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102912\FD19014.D Vial: 27  
Acq On : 10-30-2012 03:49:21 AM Operator: ashleyv  
Sample : OP6873-MB Inst : FID5  
Misc : OP6873,GFD960,30.00,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Oct 30 09:20:36 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Mon Oct 22 10:08:28 2012  
Response via : Initial Calibration  
DataAcq Meth : DRO\_FR.M

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

Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	8.96	43618115	923.359 mg/L
Target Compounds			
2) H TPH-DRO (c10-c28)	7.08	2720709	70.658 mg/L

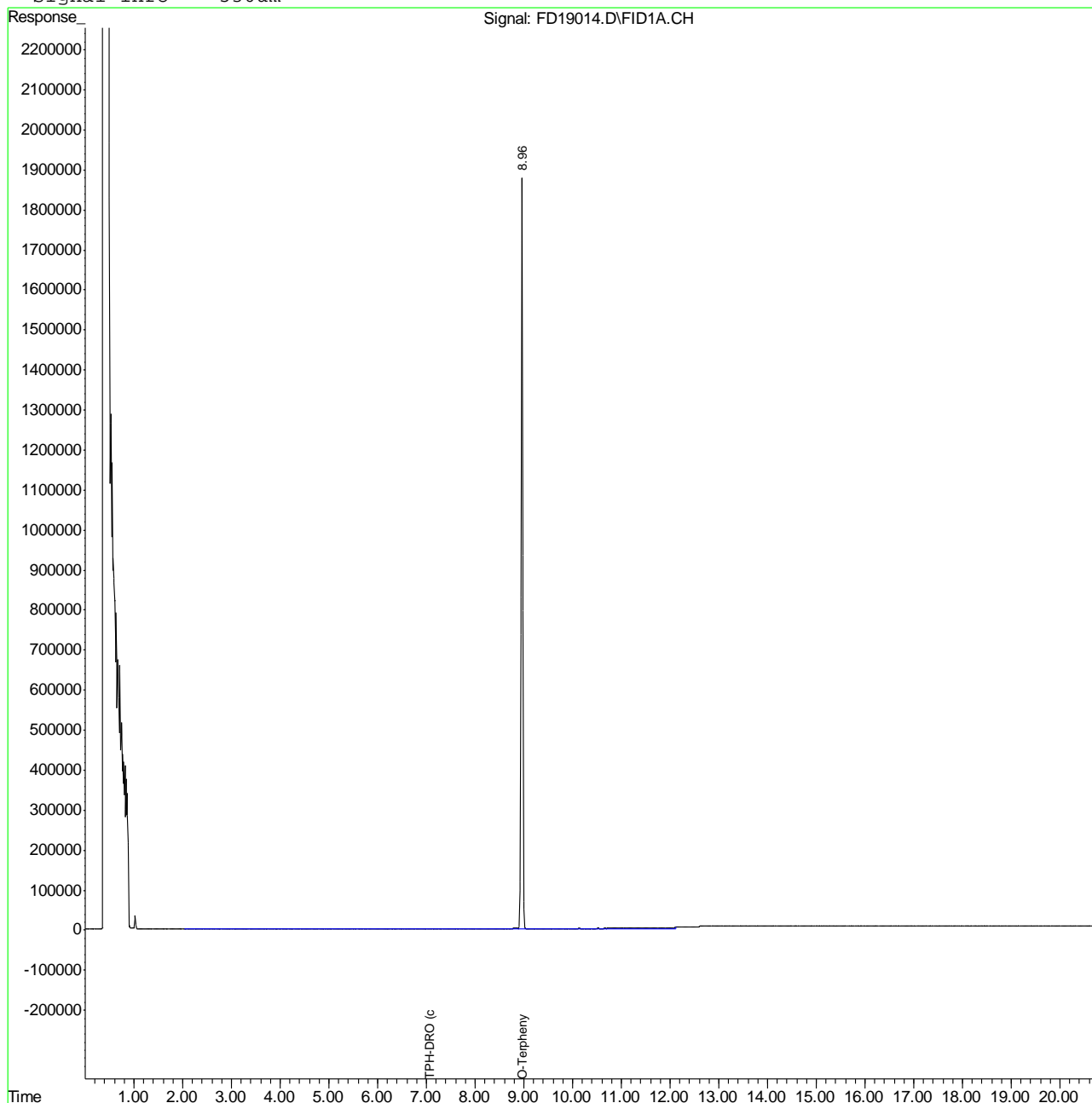
-----  
(f)=RT Delta > 1/2 Window (m)=manual int.  
FD19014.D DRO-GFD823F.M Tue Oct 30 11:28:38 2012 GC

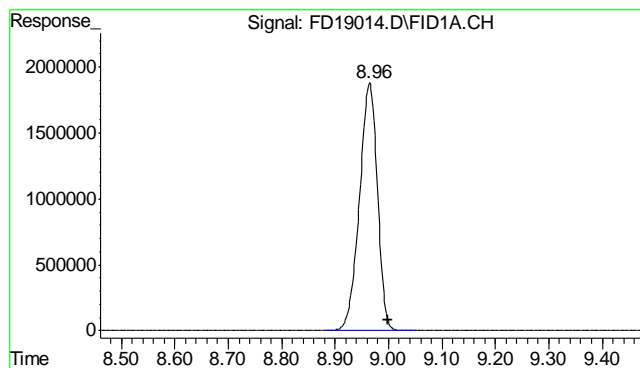
## Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102912\FD19014.D Vial: 27  
Acq On : 10-30-2012 03:49:21 AM Operator: ashleyv  
Sample : OP6873-MB Inst : FID5  
Misc : OP6873,GFD960,30.00,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Oct 30 9:20 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Mon Oct 22 10:08:28 2012  
Response via : Multiple Level Calibration  
DataAcq Meth : DRO\_FR.M

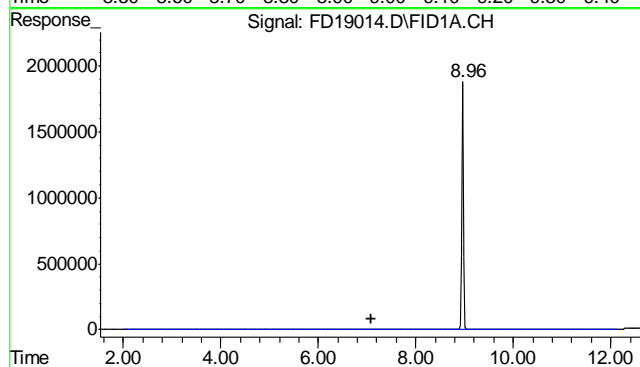
Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um





#1 O-Terphenyl

R.T.: 8.965 min  
Delta R.T.: -0.035 min  
Response: 43618115  
Conc: 923.36 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 7.075 min  
Delta R.T.: 0.000 min  
Response: 2720709  
Conc: 70.66 mg/L m

13.2.1  
13

## Metals Analysis

### QC Data Summaries

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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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 10/30/12

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	0.10	<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	0.030	<1.0
Cobalt	0.50	.04	.07		
Copper	1.0	.12	.15	-0.15	<1.0
Iron	7.0	.12	.87		
Lead	5.0	.19	.24	0.040	<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	0.0	<3.0
Phosphorus	10	1.4	1.9		
Potassium	200	6.1	7		
Selenium	5.0	.48	.36	-0.20	<5.0
Silicon	5.0	.29	.37		
Silver	3.0	.04	.06	-0.020	<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 MP8772: D40328-1

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 10/30/12

Metal	D40329-1 Original MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	10800	12600	235	765.4(a) 75-125
Beryllium	anr			
Boron	anr			
Cadmium	0.0	50.2	58.8	85.4 75-125
Calcium	anr			
Chromium	7.5	59.4	58.8	88.3 75-125
Cobalt	anr			
Copper	32.4	96.3	58.8	108.7 75-125
Iron	anr			
Lead	25.6	124	118	83.7 75-125
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	10.3	56.7	58.8	78.9 75-125
Phosphorus	anr			
Potassium	anr			
Selenium	0.91	104	118	87.7 75-125
Silicon				
Silver	0.0	22.0	23.5	93.5 75-125
Sodium	anr			
Strontium	anr			
Thallium	anr			
Tin	anr			
Titanium	anr			
Uranium				
Vanadium	anr			
Zinc	33.6	78.4	58.8	76.2 75-125

Associated samples MP8772: D40328-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

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.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 10/30/12

Metal	D40329-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	10800	12700	242	783.9(a)	25.3 (b)	20
Beryllium	anr					
Boron	anr					
Cadmium	0.0	51.0	60.6	84.2	1.6	20
Calcium	anr					
Chromium	7.5	60.0	60.6	86.6	1.0	20
Cobalt	anr					
Copper	32.4	87.1	60.6	90.3	10.0	20
Iron	anr					
Lead	25.6	122	121	79.5	1.6	20
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	10.3	57.3	60.6	77.6	1.1	20
Phosphorus	anr					
Potassium	anr					
Selenium	0.91	107	121	87.5	2.8	20
Silicon						
Silver	0.0	22.4	24.2	92.4	1.8	20
Sodium	anr					
Strontium	anr					
Thallium	anr					
Tin	anr					
Titanium	anr					
Uranium						
Vanadium	anr					
Zinc	33.6	77.2	60.6	72.0N(c)	1.5	20

Associated samples MP8772: D40328-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

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.
- (b) High RPD due to possible sample matrix or nonhomogeneity.
- (c) Spike recovery indicates possible matrix interference.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40328  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8772  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 10/30/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	200	200	100.0	80-120
Beryllium	anr			
Boron	anr			
Cadmium	45.4	50	90.8	80-120
Calcium	anr			
Chromium	48.3	50	96.6	80-120
Cobalt	anr			
Copper	46.9	50	93.8	80-120
Iron	anr			
Lead	95.0	100	95.0	80-120
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	45.7	50	91.4	80-120
Phosphorus	anr			
Potassium	anr			
Selenium	92.8	100	92.8	80-120
Silicon				
Silver	19.4	20	97.0	80-120
Sodium	anr			
Strontium	anr			
Thallium	anr			
Tin	anr			
Titanium	anr			
Uranium				
Vanadium	anr			
Zinc	46.1	50	92.2	80-120

Associated samples MP8772: D40328-1

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested



SERIAL DILUTION RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 10/30/12

Metal	D40329-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	71700	75800	14.6*(a)	0-10
Beryllium	anr			
Boron	anr			
Cadmium	0.00	0.00	NC	0-10
Calcium	anr			
Chromium	62.0	69.0	11.3*(a)	0-10
Cobalt	anr			
Copper	267	278	4.1	0-10
Iron	anr			
Lead	211	241	13.8*(a)	0-10
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	84.7	97.5	15.1*(a)	0-10
Phosphorus	anr			
Potassium	anr			
Selenium	7.50	0.00	100.0(b)	0-10
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium	anr			
Strontium	anr			
Thallium	anr			
Tin	anr			
Titanium	anr			
Uranium				
Vanadium	anr			
Zinc	277	337	21.3*(a)	0-10

Associated samples MP8772: D40328-1

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

14.1.4  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8772  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date:

Metal

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8773  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/30/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.22	.31		
Arsenic	0.10	.006	.06	0.027	<0.10
Barium	1.0	.0065	.037		
Beryllium	0.10	.016	.09		
Boron	20	1.2	1.2		
Calcium	200	7.9	8		
Chromium	1.0	.033	.19		
Cobalt	0.10	.0012	.015		
Copper	1.0	.017	.065		
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		
Uranium	0.25	.00085	.001		
Zinc	5.0	.033	.35		

Associated samples MP8773: D40328-1

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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8773  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/30/12

Metal	D40329-1 Original MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Arsenic	6.3	121	118	97.5
Beryllium	anr			
Boron	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Uranium				
Zinc	anr			

Associated samples MP8773: D40328-1

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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8773  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/30/12

Metal	D40329-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Arsenic	6.3	128	121	100.4	5.6	20
Beryllium	anr					
Boron	anr					
Chromium	anr					
Cobalt	anr					
Copper	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	anr					
Silver	anr					
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Uranium						
Zinc	anr					

Associated samples MP8773: D40328-1

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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8773  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 10/30/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Arsenic	104	100	104.0	80-120
Barium	anr			
Beryllium	anr			
Boron	anr			
Calcium	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Uranium				
Zinc	anr			

Associated samples MP8773: D40328-1

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40328  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8773  
 Matrix Type: SOLID

Methods: SW846 6020A  
 Units: ug/l

Prep Date: 10/30/12

Metal	D40329-1			QC Limits
	Original	SDL 5:25	%DIF	
Aluminum	anr			
Arsenic	51.8	52.1	0.7	0-10
Beryllium	anr			
Boron	anr			
Chromium	anr			
Cobalt	anr			
Copper	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Uranium				
Zinc	anr			

Associated samples MP8773: D40328-1

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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date: 10/30/12

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	1.5	<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	-19	<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	-230	<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 MP8775: D40328-1A

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



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date: 10/30/12

Metal	D40339-2 Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	2530000	2750000	125000	176.0(a)	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	174000	309000	125000	105.6	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	9430000	9660000	125000	184.0(a)	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP8775: D40328-1A

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

14.3.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
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.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date: 10/30/12

Metal	D40339-2 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	2530000	2670000	125000	112.0	3.0	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	174000	304000	125000	101.6	1.6	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	9430000	10100000	125000	536.0(a)	4.5	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP8775: D40328-1A

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

14.3.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date: 10/30/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	135000	125000	108.0	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 MP8775: D40328-1A

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

14.3.3

14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40328  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8775  
 Matrix Type: AQUEOUS

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

Prep Date: 10/30/12

D40339-2		QC	
Metal	Original	SDL 1:5	%DIF Limits
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Boron			
Cadmium			
Calcium	505000	549000	8.6 0-10
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Lithium			
Magnesium	34900	39400	11.5*(a) 0-10
Manganese			
Molybdenum			
Nickel			
Phosphorus			
Potassium			
Selenium			
Silicon			
Silver			
Sodium	1890000	1910000	1.4 0-10
Strontium			
Thallium			
Tin			
Titanium			
Uranium			
Vanadium			
Zinc			

Associated samples MP8775: D40328-1A

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

14.3.4  
14



SERIAL DILUTION RESULTS SUMMARY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8775  
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested  
(a) Serial dilution indicates possible matrix interference.

14.3.4  
14

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8794  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 11/01/12

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.083	.00088	.00075	0.0027	<0.083

Associated samples MP8794: D40328-1

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: D40328  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8794  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/01/12

Metal	D40329-1		Spikelot		QC
	Original	MS	HGWSR1	% Rec	Limits
Mercury	0.055	0.44	0.396	97.3	75-125

Associated samples MP8794: D40328-1

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: D40328  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8794  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/01/12

Metal	D40329-1 Original	MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.055	0.45	0.396	99.8	2.2	

Associated samples MP8794: D40328-1

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: D40328  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8794  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/01/12

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.34	0.333	102.0	80-120

Associated samples MP8794: D40328-1

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

## 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: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP8586/GN17528	1.0	0.0	mg/kg	176	179	102.0	80-120%
Specific Conductivity	GP8575/GN17488			umhos/cm	9989	9950	99.6	90-110%
pH	GN17446			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:  
Batch GP8575: D40328-1  
Batch GP8586: D40328-1  
Batch GN17446: D40328-1  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP8586/GN17528	D40427-1	mg/kg	0.0	0.0	0.0	0-20%
Redox Potential Vs H2	GN17476	D40350-1	mv	336	344	2.4	0-20%

Associated Samples:  
Batch GP8586: D40328-1  
Batch GN17476: D40328-1  
(\*) Outside of QC limits



MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP8586/GN17528	D40427-1	mg/kg	0.0	0.40	35.8	89.5	75-125%

Associated Samples:

Batch GP8586: D40328-1

Batch MP8775: D40328-1A

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D40328  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Chromium, Hexavalent	GP8586/GN17528	D40427-1	mg/kg	0.0	0.40	36.5	1.9	

Associated Samples:  
Batch GP8586: D40328-1  
Batch MP8775: D40328-1A  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits