



03/08/12

## Technical Report for

**XTO Energy**

**FRU 297-32A**

**1108-12A**

**Accutest Job Number: D32264**

**Sampling Date: 02/27/12**

**Report to:**

**cburger@krwconsulting.com**

**Total number of pages in report: 67**



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)

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Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>4</b>
<b>Section 3: Sample Results .....</b>	<b>7</b>
<b>3.1: D32264-1: CUT #1 SUBLINER .....</b>	<b>8</b>
<b>3.2: D32264-1A: CUT #1 SUBLINER .....</b>	<b>14</b>
<b>Section 4: Misc. Forms .....</b>	<b>16</b>
<b>4.1: Chain of Custody .....</b>	<b>17</b>
<b>Section 5: GC/MS Volatiles - QC Data Summaries .....</b>	<b>19</b>
<b>5.1: Method Blank Summary .....</b>	<b>20</b>
<b>5.2: Blank Spike Summary .....</b>	<b>21</b>
<b>5.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>22</b>
<b>Section 6: GC/MS Semi-volatiles - QC Data Summaries .....</b>	<b>23</b>
<b>6.1: Method Blank Summary .....</b>	<b>24</b>
<b>6.2: Blank Spike Summary .....</b>	<b>25</b>
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>26</b>
<b>Section 7: GC Volatiles - QC Data Summaries .....</b>	<b>27</b>
<b>7.1: Method Blank Summary .....</b>	<b>28</b>
<b>7.2: Blank Spike Summary .....</b>	<b>29</b>
<b>7.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>30</b>
<b>Section 8: GC Semi-volatiles - QC Data Summaries .....</b>	<b>31</b>
<b>8.1: Method Blank Summary .....</b>	<b>32</b>
<b>8.2: Blank Spike Summary .....</b>	<b>33</b>
<b>8.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>34</b>
<b>Section 9: Metals Analysis - QC Data Summaries .....</b>	<b>35</b>
<b>9.1: Prep QC MP6949: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn .....</b>	<b>36</b>
<b>9.2: Prep QC MP6950: As .....</b>	<b>46</b>
<b>9.3: Prep QC MP6954: Ca,Mg,Na,Sodium Adsorption Ratio .....</b>	<b>51</b>
<b>9.4: Prep QC MP6957: Hg .....</b>	<b>59</b>
<b>Section 10: General Chemistry - QC Data Summaries .....</b>	<b>63</b>
<b>10.1: Method Blank and Spike Results Summary .....</b>	<b>64</b>
<b>10.2: Duplicate Results Summary .....</b>	<b>65</b>
<b>10.3: Matrix Spike Results Summary .....</b>	<b>66</b>
<b>10.4: Matrix Spike Duplicate Results Summary .....</b>	<b>67</b>



Sample Summary

XTO Energy

Job No: D32264

FRU 297-32A

Project No: 1108-12A

Sample Number	Collected		Time By	Received	Matrix		Client Sample ID
	Date				Code	Type	
D32264-1	02/27/12	10:30	CH	02/28/12	SO	Soil	CUT #1 SUBLINER
D32264-1A	02/27/12	10:30	CH	02/28/12	SO	Soil	CUT #1 SUBLINER

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

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy

**Job No** D32264

**Site:** FRU 297-32A

**Report Date** 3/5/2012 3:36:19 PM

On 02/28/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.3 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D32264 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

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

### Volatiles by GCMS By Method SW846 8260B

<b>Matrix</b> SO	<b>Batch ID:</b> V5V1189
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D32031-1MS, D32031-1MSD 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

<b>Matrix</b> SO	<b>Batch ID:</b> OP5450
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D32264-1MS, D32264-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Volatiles by GC By Method SW846 8015B

<b>Matrix</b> SO	<b>Batch ID:</b> GGB850
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D32200-1MS, D32200-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32200-1MS, D32200-1MSD have surrogates outside control limits. Probable cause due to matrix interference.
- D32200-1MS/MSD for 1,2,4-Trichlorobenzene: Outside control limits due to high level in sample relative to spike amount.

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

<b>Matrix</b> SO	<b>Batch ID:</b> OP5445
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32234-1MS, D32234-1MSD were used as the QC samples indicated.

## Metals By Method SW846 6010C

**Matrix** AQ

**Batch ID:** MP6954

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32264-1AMS, D32264-1AMSD were used as the QC samples for the metals analysis.

**Matrix** SO

**Batch ID:** MP6949

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32264-1MS, D32264-1MSD, D32264-1SDL were used as the QC samples for the metals analysis.
- The RPD(s) for the MS and MSD recoveries of Barium are outside control limits for sample MP6949-S2. High RPD due to possible sample matrix or nonhomogeneity.
- The serial dilution RPD(s) for Cadmium, Selenium, Silver, Barium, Chromium, Nickel, Zinc are outside control limits for sample MP6949-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP6949-SD1 for Barium, Chromium, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

## Metals By Method SW846 6020A

**Matrix** SO

**Batch ID:** MP6950

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32264-1MSD, D32264-1SDL, D32264-1MS were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Arsenic are outside control limits. Spike recovery indicates possible matrix interference.
- The matrix spike duplicate (MSD) recovery(s) of Arsenic are outside control limits. Probable cause due to matrix interference.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP6950-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

## Metals By Method SW846 7471B

**Matrix** SO

**Batch ID:** MP6957

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32264-1MS, D32264-1MSD were used as the QC samples for the metals analysis.

## Wet Chemistry By Method ASTM D1498-76M

**Matrix** SO

**Batch ID:** GN13908

- Sample(s) D32298-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

## Wet Chemistry By Method DEPT.OF AG, BOOK N9

**Matrix** SO

**Batch ID:** GP6620

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

## Wet Chemistry By Method SM19 2540B M

**Matrix** SO

**Batch ID:** GN13887

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

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

**Matrix** SO

**Batch ID:** R11949

- The data for SW846 3060/7196A M meets quality control requirements.
- D32264-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

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

**Matrix** SO

**Batch ID:** GP6606

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D32207-1DUP, D32207-1MSD were used as the QC samples for the Chromium, Hexavalent analysis.
- The matrix spike (MS) recovery(s) of Chromium, Hexavalent are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- The matrix spike duplicate (MSD) recovery(s) of Chromium, Hexavalent are outside control limits. Probable cause due to matrix interference.

### Wet Chemistry By Method SW846 9045C

**Matrix** SO

**Batch ID:** GN13884

- D32264-1 for pH: Non Corrosive

### Wet Chemistry By Method USDA HANDBOOK 60

**Matrix** SO

**Batch ID:** MP6954

- D32264-1A 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.

## Sample Results

## Report of Analysis

## Report of Analysis

Client Sample ID:	CUT #1 SUBLINER	Date Sampled:	02/27/12
Lab Sample ID:	D32264-1	Date Received:	02/28/12
Matrix:	SO - Soil	Percent Solids:	91.6
Method:	SW846 8260B		
Project:	FRU 297-32A		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V19800.D	1	03/03/12	KV	n/a	n/a	V5V1189
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.00 g	5.0 ml	100 ul
Run #2			

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.0533	0.059	0.026	mg/kg	J
108-88-3	Toluene	0.125	0.12	0.059	mg/kg	
100-41-4	Ethylbenzene	0.0379	0.12	0.030	mg/kg	J
1330-20-7	Xylene (total)	0.192	0.24	0.12	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	95%		61-130%
460-00-4	4-Bromofluorobenzene	97%		53-131%
17060-07-0	1,2-Dichloroethane-D4	81%		62-130%

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



## Report of Analysis

Client Sample ID:	CUT #1 SUBLINER	Date Sampled:	02/27/12
Lab Sample ID:	D32264-1	Date Received:	02/28/12
Matrix:	SO - Soil	Percent Solids:	91.6
Method:	SW846 8270C BY SIM SW846 3546		
Project:	FRU 297-32A		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G08232.D	1	03/01/12	DC	02/28/12	OP5450	E3G331
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0091	0.0047	mg/kg	
120-12-7	Anthracene	ND	0.0091	0.0047	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0091	0.0047	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0091	0.0047	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0091	0.0047	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0091	0.0047	mg/kg	
218-01-9	Chrysene	ND	0.0091	0.0047	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0091	0.0047	mg/kg	
206-44-0	Fluoranthene	ND	0.0091	0.0047	mg/kg	
86-73-7	Fluorene	ND	0.0091	0.0047	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0091	0.0047	mg/kg	
91-20-3	Naphthalene	0.0309	0.013	0.011	mg/kg	
129-00-0	Pyrene	ND	0.0091	0.0047	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	60%		10-145%
321-60-8	2-Fluorobiphenyl	56%		10-130%
1718-51-0	Terphenyl-d14	60%		22-130%

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

## Report of Analysis

Client Sample ID:	CUT #1 SUBLINER	Date Sampled:	02/27/12
Lab Sample ID:	D32264-1	Date Received:	02/28/12
Matrix:	SO - Soil	Percent Solids:	91.6
Method:	SW846 8015B		
Project:	FRU 297-32A		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB15152.D	1	02/29/12	SK	n/a	n/a	GGB850
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	5.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	94%		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

## Report of Analysis

Client Sample ID:	CUT #1 SUBLINER	Date Sampled:	02/27/12
Lab Sample ID:	D32264-1	Date Received:	02/28/12
Matrix:	SO - Soil	Percent Solids:	91.6
Method:	SW846-8015B SW846 3546		
Project:	FRU 297-32A		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH001812.D	1	02/29/12	TR	02/28/12	OP5445	GFH93
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	54.2	15	9.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	65%		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: CUT #1 SUBLINER

Lab Sample ID: D32264-1

Matrix: SO - Soil

Project: FRU 297-32A

Date Sampled: 02/27/12

Date Received: 02/28/12

Percent Solids: 91.6

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2.6	0.44	mg/kg	5	02/29/12	02/29/12 GJ	SW846 6020A <sup>3</sup>	SW846 3050B <sup>5</sup>
Barium	1390	1.1	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Cadmium	< 1.1	1.1	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Chromium	41.5	1.1	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Copper	12.0	1.1	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Lead	10	5.5	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Mercury	< 0.11	0.11	mg/kg	1	03/01/12	03/01/12 JB	SW846 7471B <sup>2</sup>	SW846 7471B <sup>6</sup>
Nickel	17.4	3.3	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Selenium	< 5.5	5.5	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Silver	< 3.3	3.3	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Zinc	42.3	3.3	mg/kg	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA2220

(2) Instrument QC Batch: MA2222

(3) Instrument QC Batch: MA2223

(4) Prep QC Batch: MP6949

(5) Prep QC Batch: MP6950

(6) Prep QC Batch: MP6957

RL = Reporting Limit

## Report of Analysis

Client Sample ID: CUT #1 SUBLINER  
Lab Sample ID: D32264-1  
Matrix: SO - Soil  
Project: FRU 297-32A

Date Sampled: 02/27/12  
Date Received: 02/28/12  
Percent Solids: 91.6

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	02/29/12 07:45	CJ	SW846 3060A/7196A
Chromium, Trivalent <sup>a</sup>	41.5	2.1	mg/kg	1	02/29/12 15:47	JM	SW846 3060/7196A M
Redox Potential Vs H2	358		mv	1	02/29/12	JK	ASTM D1498-76M
Solids, Percent	91.6		%	1	02/29/12	SWT	SM19 2540B M
Specific Conductivity	1480	1.0	umhos/cm	1	02/29/12	JK	DEPT.OF AG, BOOK N9
pH <sup>b</sup>	9.47		su	1	02/28/12 14:45	JK	SW846 9045C

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

(b) Non Corrosive

RL = Reporting Limit

## Report of Analysis

Client Sample ID: CUT #1 SUBLINER

Lab Sample ID: D32264-1A

Matrix: SO - Soil

Project: FRU 297-32A

Date Sampled: 02/27/12

Date Received: 02/28/12

Percent Solids: 91.6

## SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	20.0	2.0	mg/l	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	EPA 200.7 <sup>2</sup>
Magnesium	13.9	1.0	mg/l	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	EPA 200.7 <sup>2</sup>
Sodium	288	2.0	mg/l	1	02/29/12	02/29/12 JM	SW846 6010C <sup>1</sup>	EPA 200.7 <sup>2</sup>

(1) Instrument QC Batch: MA2220

(2) Prep QC Batch: MP6954

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CUT #1 SUBLINER	Date Sampled:	02/27/12
Lab Sample ID:	D32264-1A	Date Received:	02/28/12
Matrix:	SO - Soil	Percent Solids:	91.6
Project:	FRU 297-32A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	12.1		ratio	1	02/29/12 13:03	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

## Misc. Forms

### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Chain of Custody



Accutest Laboratories Mountain States  
4036 Youngfield Street Wheat Ridge, Co. 80033  
TEL 303-425-6021 877-737-4521  
FAX 303-425-6021

ACCUtest LABORATORIES		Accutest Laboratories Mountain States 4036 Youngfield Street Wheat Ridge, Co 80033 TEL: 303-425-6021 877-737-4521 FAX: 303-425-6021		FED-EX Tracking #		Bottle Order Control #	
Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)		Matrix Codes	
<b>Company Name</b> <b>KRW Consulting</b> <b>Street Address</b> <b>2000 W. 14th Ave #80214</b> <b>City</b> <b>Lakewood CO 80214</b> <b>Project Contact</b> <b>Dwayne Knudson</b> <b>Phone #</b> <b>970-488-1098</b> <b>Sampler(s) Name(s)</b> <b>C. Hollister 303.565.9365</b>		<b>Project Name</b> <b>XTO-FRU-297-32A</b> <b>Street:</b> <b>Billing Information (if different from Report to)</b> <b>Company Name</b> <b>XTO Energy</b> <b>Street Address</b> <b>21459 CR5</b> <b>City</b> <b>Rifle CO 81650</b> <b>State</b> <b>PO#</b> <b>Jessica Dooling</b>		<b>Requested Analysis (see TEST CODE sheet)</b> <b>Matrix Codes</b> DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank			
<b>Field ID / Point of Collection</b> <b>Cut #1 Subliner</b>		<b>MEOH/DI Vol #</b> <b>2/27/12 10:30 CH</b>		<b>Number of preserved bottles</b> HCl <input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO3 <input checked="" type="checkbox"/> H2SO4 <input checked="" type="checkbox"/> NONE <input checked="" type="checkbox"/> DI Water <input checked="" type="checkbox"/> MEOH <input checked="" type="checkbox"/> ENCORE <input checked="" type="checkbox"/> Stabilizers <input checked="" type="checkbox"/>		<b>LAB USE ONLY</b> <b>01</b> <b>1/238</b>	
<b>Turnaround Time (Business days)</b> <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day FR SH <input checked="" type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <b>Emergency &amp; Rush TIA data available VIA Lablink</b>		<b>Approved By (Accutest PMI) / Date:</b>      		<b>Data Deliverable Information</b> <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> Commercial "B" + Narrative <input type="checkbox"/> FULLT1 (Level 3-4) <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input checked="" type="checkbox"/> PDF Commercial "A" = Results Only Commercial "B" = Results + QC Summary		<b>Comments / Special Instructions</b> <b>Please email results to KRW Piceance Creek Team</b>	
<b>Sample Custody must be documented below each time samples change possession, including courier delivery.</b>							
<b>Relinquished by:</b> <b>1/27/12</b>		<b>Received By:</b> <b>1/27/12</b>		<b>Relinquished By:</b> <b>2/27/12</b>		<b>Received By:</b> <b>2/27/12</b>	
<b>Relinquished by:</b> <b>3/28/12</b>		<b>Received By:</b> <b>3/28/12</b>		<b>Relinquished By:</b> <b>4/28/12</b>		<b>Received By:</b> <b>4/28/12</b>	
<b>Relinquished by:</b> <b>5/28/12</b>		<b>Received By:</b> <b>5/28/12</b>		<b>Custody Seal #</b> <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact		<b>Preserved where applicable</b> <input type="checkbox"/> On Ice <input checked="" type="checkbox"/> Cooler Temp. <b>3.3</b>	

### D32264: Chain of Custody

Page 1 of 2

# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D32264

Client: KRW CONSULTING INC

Immediate Client Services Action Required: No

Date / Time Received: 2/28/2012 12:52:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XTO-FRU-297-32A

Airbill #'s: HD CO

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

## GC/MS Volatiles

5

## 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: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1189-MB	5V19781.D	1	03/03/12	KV	n/a	n/a	V5V1189

The QC reported here applies to the following samples:

Method: SW846 8260B

D32264-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	22	ug/kg	
100-41-4	Ethylbenzene	ND	100	25	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	110% 61-130%
460-00-4	4-Bromofluorobenzene	99% 53-131%
17060-07-0	1,2-Dichloroethane-D4	119% 62-130%

## Blank Spike Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1189-BS	5V19782.D	1	03/03/12	KV	n/a	n/a	V5V1189

The QC reported here applies to the following samples:

Method: SW846 8260B

D32264-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	48.9	98	70-130
100-41-4	Ethylbenzene	50	53.5	107	70-130
108-88-3	Toluene	50	50.1	100	70-130
1330-20-7	Xylene (total)	150	159	106	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	105%	61-130%
460-00-4	4-Bromofluorobenzene	116%	53-131%
17060-07-0	1,2-Dichloroethane-D4	108%	62-130%

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D32031-1MS	5V19784.D	1	03/03/12	KV	n/a	n/a	V5V1189
D32031-1MSD	5V19785.D	1	03/03/12	KV	n/a	n/a	V5V1189
D32031-1	5V19783.D	1	03/03/12	KV	n/a	n/a	V5V1189

The QC reported here applies to the following samples:

Method: SW846 8260B

D32264-1

CAS No.	Compound	D32031-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		3480	3640	105	3440	99	6	70-134/30
100-41-4	Ethylbenzene	ND		3480	4040	116	3800	109	6	70-137/30
108-88-3	Toluene	ND		3480	3700	106	3480	100	6	70-130/30
1330-20-7	Xylene (total)	ND		10400	12200	117	11400	109	7	61-131/30

CAS No.	Surrogate Recoveries	MS	MSD	D32031-1	Limits
2037-26-5	Toluene-D8	108%	104%	105%	61-130%
460-00-4	4-Bromofluorobenzene	127%	122%	110%	53-131%
17060-07-0	1,2-Dichloroethane-D4	101%	97%	113%	62-130%

## GC/MS Semi-volatiles

### QC Data Summaries

Includes the following where applicable:

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

## Method Blank Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5450-MB	3G08227.D	1	02/29/12	DC	02/28/12	OP5450	E3G331

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D32264-1

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	81% 10-145%
321-60-8	2-Fluorobiphenyl	74% 10-130%
1718-51-0	Terphenyl-d14	95% 22-130%



## Blank Spike Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5450-BS	3G08228.D	1	02/29/12	DC	02/28/12	OP5450	E3G331

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D32264-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	66.1	79	34-130
120-12-7	Anthracene	83.3	68.8	83	35-130
56-55-3	Benzo(a)anthracene	83.3	65.8	79	36-130
50-32-8	Benzo(a)pyrene	83.3	56.2	67	36-130
205-99-2	Benzo(b)fluoranthene	83.3	59.3	71	35-130
207-08-9	Benzo(k)fluoranthene	83.3	73.7	88	37-130
218-01-9	Chrysene	83.3	70.5	85	40-130
53-70-3	Dibenzo(a,h)anthracene	83.3	74.2	89	32-130
206-44-0	Fluoranthene	83.3	69.4	83	38-130
86-73-7	Fluorene	83.3	66.6	80	35-130
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	67.2	81	28-130
91-20-3	Naphthalene	83.3	65.6	79	35-130
129-00-0	Pyrene	83.3	72.1	87	37-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	76%	10-145%
321-60-8	2-Fluorobiphenyl	69%	10-130%
1718-51-0	Terphenyl-d14	78%	22-130%

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5450-MS	3G08233.D	1	03/01/12	DC	02/28/12	OP5450	E3G331
OP5450-MSD	3G08234.D	1	03/01/12	DC	02/28/12	OP5450	E3G331
D32264-1	3G08232.D	1	03/01/12	DC	02/28/12	OP5450	E3G331

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D32264-1

CAS No.	Compound	D32264-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		90.9	60.2	66	59.7	66	1	10-155/30
120-12-7	Anthracene	ND		90.9	62.3	69	62.3	69	0	10-155/30
56-55-3	Benzo(a)anthracene	ND		90.9	66.3	73	65.9	72	1	10-175/30
50-32-8	Benzo(a)pyrene	ND		90.9	53.8	59	54.6	60	1	10-164/30
205-99-2	Benzo(b)fluoranthene	ND		90.9	53.2	58	54.0	59	1	10-165/30
207-08-9	Benzo(k)fluoranthene	ND		90.9	49.1	54	50.9	56	4	10-178/30
218-01-9	Chrysene	ND		90.9	63.2	69	62.9	69	0	10-147/30
53-70-3	Dibenzo(a,h)anthracene	ND		90.9	102	112	92.6	102	10	10-144/30
206-44-0	Fluoranthene	ND		90.9	51.6	57	51.6	57	0	10-207/30
86-73-7	Fluorene	ND		90.9	66.2	73	65.5	72	1	10-163/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		90.9	119	131	112	123	6	10-180/30
91-20-3	Naphthalene	30.9		90.9	97.6	73	93.3	69	5	10-198/30
129-00-0	Pyrene	ND		90.9	63.7	70	59.6	66	7	10-189/30

CAS No.	Surrogate Recoveries	MS	MSD	D32264-1	Limits
4165-60-0	Nitrobenzene-d5	60%	62%	60%	10-145%
321-60-8	2-Fluorobiphenyl	59%	60%	56%	10-130%
1718-51-0	Terphenyl-d14	61%	60%	60%	22-130%

## GC 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: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB850-MB	GB15143.D	1	02/29/12	SK	n/a	n/a	GGB850

The QC reported here applies to the following samples:

Method: SW846 8015B

D32264-1

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	104% 60-140%

Blank Spike Summary

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB850-BS	GB15144.D	1	02/29/12	SK	n/a	n/a	GGB850

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

D32264-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	107	97	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	110%	60-140%

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D32200-1MS	GB15146.D	1	02/29/12	SK	n/a	n/a	GGB850
D32200-1MSD	GB15147.D	1	02/29/12	SK	n/a	n/a	GGB850
D32200-1	GB15145.D	1	02/29/12	SK	n/a	n/a	GGB850

The QC reported here applies to the following samples:

Method: SW846 8015B

D32264-1

CAS No.	Compound	D32200-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	1000		212	1170	80	1160	75	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D32200-1	Limits
120-82-1	1,2,4-Trichlorobenzene	196%* b	193%* b	202%* a	60-140%

(a) Outside control limits due to possible matrix interference.

(b) Outside control limits due to high level in sample relative to spike amount.

## GC 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: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5445-MB	FH001772.D	1	02/28/12	TR	02/28/12	OP5445	GFH93

The QC reported here applies to the following samples:

Method: SW846-8015B

D32264-1

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	104% 43-136%

8.1.1

8



## Blank Spike Summary

Page 1 of 1

Job Number: D32264

Account: XTOKRWR XTO Energy

Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5445-BS	FH001774.D	1	02/28/12	TR	02/28/12	OP5445	GFH93

The QC reported here applies to the following samples:

Method: SW846-8015B

D32264-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	550	82	58-130

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

8.2.1

8

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D32264  
Account: XTOKRWR XTO Energy  
Project: FRU 297-32A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5445-MS	FH001776.D	1	02/28/12	TR	02/28/12	OP5445	GFH93
OP5445-MSD	FH001778.D	1	02/28/12	TR	02/28/12	OP5445	GFH93
D32234-1	FH001780.D	1	02/28/12	TR	02/28/12	OP5445	GFH93

The QC reported here applies to the following samples:

Method: SW846-8015B

D32264-1

CAS No.	Compound	D32234-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	20.9		755	553	70	585	75	6	20-183/43

CAS No.	Surrogate Recoveries	MS	MSD	D32234-1	Limits
84-15-1	o-Terphenyl	75%	79%	80%	43-136%

8.3.1

8

## 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: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/29/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.59	.59		
Antimony	3.0	.31	.31		
Arsenic	2.5	.59	.59		
Barium	1.0	.11	.11	0.050	<1.0
Beryllium	1.0	.044	.1		
Boron	5.0	.48	.48		
Cadmium	1.0	.027	.27	0.010	<1.0
Calcium	40	.96	1.1		
Chromium	1.0	.018	.031	0.010	<1.0
Cobalt	0.50	.035	.035		
Copper	1.0	.085	.16	0.18	<1.0
Iron	7.0	.34	2		
Lead	5.0	.16	.21	-0.10	<5.0
Lithium	0.20	.028	.031		
Magnesium	20	.58	1.4		
Manganese	0.50	.0053	.012		
Molybdenum	1.0	.045	.054		
Nickel	3.0	.043	.099	0.010	<3.0
Phosphorus	10	1.1	1.2		
Potassium	200	5.5	9.2		
Selenium	5.0	.38	.5	0.030	<5.0
Silicon	5.0	.38	.51		
Silver	3.0	.018	.051	0.020	<3.0
Sodium	40	11	11		
Strontium	5.0		.017		
Thallium	1.0	.29	.34		
Tin	5.0	.55	1.3		
Titanium	1.0	.011	.1		
Uranium	5.0	.15	.2		
Vanadium	1.0	.016	.025		
Zinc	3.0	.028	.06	0.16	<3.0

Associated samples MP6949: D32264-1

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/29/12

Metal	D32264-1 Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	1390	1590	218	91.6	75-125
Beryllium	anr				
Boron					
Cadmium	0.13	47.6	54.6	87.0	75-125
Calcium	anr				
Chromium	41.5	88.5	54.6	86.1	75-125
Cobalt					
Copper	12.0	62.3	54.6	92.1	75-125
Iron	anr				
Lead	10	96.8	109	79.5	75-125
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum	anr				
Nickel	17.4	59.4	54.6	76.9	75-125
Phosphorus	anr				
Potassium					
Selenium	1.9	95.4	109	85.6	75-125
Silicon					
Silver	0.087	20.4	21.8	93.0	75-125
Sodium	anr				
Strontium					
Thallium	anr				
Tin					
Titanium					
Uranium	anr				
Vanadium					
Zinc	42.3	84.2	54.6	76.8	75-125

Associated samples MP6949: D32264-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/29/12

Metal	D32264-1 Original MSD		SpikeLot MPICPALL % Rec		MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	1390	1980	223	264.8(a)	21.8 (b)	20
Beryllium	anr					
Boron						
Cadmium	0.13	50.1	55.7	89.7	5.1	20
Calcium	anr					
Chromium	41.5	94.2	55.7	94.6	6.2	20
Cobalt						
Copper	12.0	67.0	55.7	98.7	7.3	20
Iron	anr					
Lead	10	102	111	82.6	5.2	20
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	17.4	64.0	55.7	83.7	7.5	20
Phosphorus	anr					
Potassium						
Selenium	1.9	101	111	89.0	5.7	20
Silicon						
Silver	0.087	21.7	22.3	97.0	6.2	20
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Uranium	anr					
Vanadium						
Zinc	42.3	89.0	55.7	83.8	5.5	20

Associated samples MP6949: D32264-1

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



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
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.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D32264  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 297-32A

QC Batch ID: MP6949  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 02/29/12

Metal	BSP Result	Spikelot MPICPAL	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	188	200	94.0	80-120
Beryllium	anr			
Boron				
Cadmium	46.8	50	93.6	80-120
Calcium	anr			
Chromium	49.8	50	99.6	80-120
Cobalt				
Copper	49.4	50	98.8	80-120
Iron	anr			
Lead	92.4	100	92.4	80-120
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	46.7	50	93.4	80-120
Phosphorus	anr			
Potassium				
Selenium	95.3	100	95.3	80-120
Silicon				
Silver	20.6	20	103.0	80-120
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc	47.0	50	94.0	80-120

Associated samples MP6949: D32264-1

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 02/29/12

Metal	D32264-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	12700	14200	11.8*(a)	0-10
Beryllium	anr			
Boron				
Cadmium	1.20	0.00	100.0(b)	0-10
Calcium	anr			
Chromium	380	432	13.6*(a)	0-10
Cobalt				
Copper	110	107	3.4	0-10
Iron	anr			
Lead	91.2	92.0	0.9	0-10
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum	anr			
Nickel	159	190	19.0*(a)	0-10
Phosphorus	anr			
Potassium				
Selenium	17.0	0.00	100.0(b)	0-10
Silicon				
Silver	0.800	4.00	400.0(b)	0-10
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc	388	477	22.9*(a)	0-10

Associated samples MP6949: D32264-1

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6949  
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).

9.1.4

9

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6950  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 02/29/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.3		
Antimony	0.20	.001	.012		
Arsenic	0.40	.049		-0.10	<0.40
Barium	1.0	.0035	.025		
Beryllium	0.10	.0075	.055		
Boron	20	.97	.6		
Cadmium	0.050	.023	.034		
Calcium	200	1.8	9.5		
Chromium	1.0	.021	.041		
Cobalt	0.10	.0033	.0085		
Copper	1.0	.011	.055		
Iron	20	.81	18		
Lead	0.25	.0012	.023		
Magnesium	50	.067	.6		
Manganese	0.50	.007	.039		
Molybdenum	0.50	.0044	.025		
Nickel	1.0	.0029	.031		
Phosphorus	30	1.8	3.5		
Potassium	100	2	6		
Selenium	0.20	.075			
Silver	0.050	.0008	.022		
Sodium	250	.8	3		
Strontium	10	.004	.024		
Thallium	0.10	.015	.013		
Tin	5.0	.006	.15		
Titanium	1.0	.035	.12		
Uranium	0.25	.00038	.008		
Vanadium	2.0	.052	.19		
Zinc	5.0	.039	.23		

Associated samples MP6950: D32264-1

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: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6950  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 02/29/12

Metal	D32264-1 Original MS		Spikelot MPICPALL % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	2.6	81.7	109	72.5N(a) 75-125
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP6950: D32264-1

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  
(a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6950  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 02/29/12

Metal	D32264-1 Original	MSD	SpikeLot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	2.6	85.7	111	74.6N(a)	4.8	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP6950: D32264-1

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  
(a) Spike recovery indicates possible matrix interference.



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6950  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 02/29/12

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	105	100	105.0	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP6950: D32264-1

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

# SERIAL DILUTION RESULTS SUMMARY

Login Number: D32264  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 297-32A

QC Batch ID: MP6950  
 Matrix Type: SOLID

Methods: SW846 6020A  
 Units: ug/l

Prep Date: 02/29/12

Metal	D32264-1			QC
	Original	SDL 5:25	%DIF	Limits

Aluminum				
Antimony				
Arsenic	24.1	27.5	14.1 (a)	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP6950: D32264-1

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
Matrix Type: AQUEOUS

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

Prep Date: 02/29/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	30	30		
Antimony	150	16	16		
Arsenic	130	30	30		
Barium	50	5.5	5.5		
Beryllium	50	2.2	2.5		
Boron	250	24	24		
Cadmium	50	1.4	1.4		
Calcium	2000	48	75	17.0	<2000
Chromium	50	.9	4		
Cobalt	25	1.8	1.8		
Copper	50	4.3	14		
Iron	350	17	65		
Lead	250	8	11		
Lithium	10	1.4	6		
Magnesium	1000	29	50	-17	<1000
Manganese	25	.27	1.6		
Molybdenum	50	2.3	4.4		
Nickel	150	2.2	5		
Phosphorus	500	55	100		
Potassium	5000	280	280		
Selenium	250	19	19		
Silicon	250	19	19		
Silver	150	.9	1.6		
Sodium	2000	570	570	39.5	<2000
Strontium	25		1.3		
Thallium	50	15	15		
Tin	250	28	50		
Titanium	50	.55	1.6		
Uranium	250	7.5	18		
Vanadium	50	.8	1.1		
Zinc	150	1.4	9		

Associated samples MP6954: D32264-1A

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

9.3.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
Matrix Type: AQUEOUS

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

Prep Date: 02/29/12

Metal	D32264-1A Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	20000	154000	125000	107.2	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	13900	142000	125000	102.5	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	288000	429000	125000	112.8	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP6954: D32264-1A

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
Matrix Type: AQUEOUS

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

Prep Date: 02/29/12

Metal	D32264-1A Original	MSD	SpikeLot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	20000	152000	125000	105.6	1.3	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	13900	140000	125000	100.9	1.4	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	288000	409000	125000	96.8	4.8	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP6954: D32264-1A

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
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



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
Matrix Type: AQUEOUS

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

Prep Date: 02/29/12

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	131000	125000	104.8	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	125000	125000	100.0	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	128000	125000	102.4	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP6954: D32264-1A

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6954  
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6957  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 03/01/12

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.10	.0011	.013	0.0039	<0.10

Associated samples MP6957: D32264-1

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: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

QC Batch ID: MP6957  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 03/01/12

Metal	D32264-1		Spikelot		QC	
	Original	MS	HGWSR1	% Rec	Limits	
Mercury	0.020	0.39	0.437	84.7	75-125	

Associated samples MP6957: D32264-1

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: D32264  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 297-32A

QC Batch ID: MP6957  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 03/01/12

Metal	D32264-1		Spikelot	% Rec	MSD	QC
	Original	MSD	HGWSR1		RPD	Limit
Mercury	0.020	0.40	0.446	85.3	2.5	

Associated samples MP6957: D32264-1

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: D32264  
 Account: XTOKRWR - XTO Energy  
 Project: FRU 297-32A

QC Batch ID: MP6957  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 03/01/12

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

Associated samples MP6957: D32264-1

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: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP6606/GN13901	1.0	0.0	mg/kg	150	151	100.7	80-120%
Specific Conductivity	GP6620/GN13895	1.0	<1.0	umhos/cm	9967	9830	98.6	90-110%
pH	GN13884			su	8.00	7.98	99.8	99.3-100.7%

Associated Samples:  
Batch GN13884: D32264-1  
Batch GP6606: D32264-1  
Batch GP6620: D32264-1  
(\*) Outside of QC limits



DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP6606/GN13901	D32207-1	mg/kg	0.0	0.0	0.0	0-20%
Redox Potential Vs H2	GN13908	D32298-1	mv	349	344	1.4	0-20%

Associated Samples:  
Batch GN13908: D32264-1  
Batch GP6606: D32264-1  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP6606/GN13901	D32207-1	mg/kg	0.0	40	1.1	0.0*(a)	75-125%

Associated Samples:

Batch GP6606: D32264-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D32264  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-32A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Chromium, Hexavalent	GP6606/GN13901	D32207-1	mg/kg	0.0	40	0.750	39.1	

Associated Samples:  
Batch GP6606: D32264-1  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits