



02/01/12

## Technical Report for

**XTO Energy**

**FRU 297-20A**

**1108-10A**

**Accutest Job Number: D31468**

**Sampling Date: 01/30/12**

### Report to:

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

**Total number of pages in report: 25**



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

  
**Brad Madadian**  
Laboratory Director

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

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

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Test results relate only to samples analyzed.

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Sample Summary

XTO Energy

Job No: D31468

FRU 297-20A

Project No: 1108-10A

Sample Number	Collected		Time By	Received	Matrix		Client Sample ID
	Date				Code	Type	
D31468-1	01/30/12	11:10	CB	01/31/12	SO	Soil	RP CONTENTS MIX BLEND 1/26
D31468-2	01/30/12	11:15	CB	01/31/12	SO	Soil	RP CONTENTS MIX BLEND 1/27

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

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy**Job No** D31468**Site:** FRU 297-20A**Report Dat** 2/1/2012 9:57:15 AM

On 01/31/2012, 2 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D31468 was assigned to the project. The lab sample IDs, client sample IDs, 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.

### Metals By Method SW846 6010C

**Matrix** SO**Batch ID:** MP6755

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D31412-1MSD, D31412-1SDL, D31412-1MS were used as the QC samples for the metals analysis.
- The matrix spike (MS) and matrix spike duplicate (MS/MSD) 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.

### Wet Chemistry By Method SM19 2540B M

**Matrix** SO**Batch ID:** GN13488

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

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:	RP CONTENTS MIX BLEND 1/26			Date Sampled:	01/30/12
Lab Sample ID:	D31468-1			Date Received:	01/31/12
Matrix:	SO - Soil			Percent Solids:	71.6
Project:	FRU 297-20A				

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	12500	7.0	mg/kg	5	01/31/12	01/31/12 JB	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA2152  
(2) Prep QC Batch: MP6755

RL = Reporting Limit

Report of Analysis

Client Sample ID:	RP CONTENTS MIX BLEND 1/26	Date Sampled:	01/30/12
Lab Sample ID:	D31468-1	Date Received:	01/31/12
Matrix:	SO - Soil	Percent Solids:	71.6
Project:	FRU 297-20A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	71.6		%	1	01/31/12	SWT	SM19 2540B M
pH	11.48		su	1	01/31/12 14:20	JD	SW846 9045C

RL = Reporting Limit

Report of Analysis

Client Sample ID:	RP CONTENTS MIX BLEND 1/27				Date Sampled:	01/30/12
Lab Sample ID:	D31468-2				Date Received:	01/31/12
Matrix:	SO - Soil				Percent Solids:	64.8
Project:	FRU 297-20A					

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	10000	7.9	mg/kg	5	01/31/12	01/31/12 JB	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA2152  
(2) Prep QC Batch: MP6755

RL = Reporting Limit



Report of Analysis

Client Sample ID:	RP CONTENTS MIX BLEND 1/27	Date Sampled:	01/30/12
Lab Sample ID:	D31468-2	Date Received:	01/31/12
Matrix:	SO - Soil	Percent Solids:	64.8
Project:	FRU 297-20A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	64.8		%	1	01/31/12	SWT	SM19 2540B M
pH	11.23		su	1	01/31/12 14:20	JD	SW846 9045C

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

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>D31468</b>	
Client / Reporting Information		Project Information	
Company Name <b>KRW Consulting Inc</b>		Project Name <b>XTO FRU 297-20A</b>	
Street Address <b>8000 W. 14th Ave Ste 200</b>		Street: <b>Lakewood CO 80214</b>	
City, State, Zip <b>Lakewood CO 80214</b>		City: <b>1108-10A</b>	
Project Contact <b>Dwayne Kudson</b>		Project# <b>1108-10A</b>	
Phone # <b>303 239 9011</b>		Client PO#	
Fax #		City, State, Zip <b>Krile CO 81650</b>	
Sample(s) Name(s) <b>Craig Burger 970 319 4520</b>		Project Manager <b>Joe Hew</b>	
Phone #		Attention: <b>Jew'ia Pooling</b>	
PO#		PO#	
Field ID / Point of Collection		Collection	
MEOH/DI Vial #		Date	
Time		Sampled by	
Matrix		# of bottles	
HCl		NaOH	
HNO3		H2SO4	
H3PO4		NONE	
DI Water		MEOH	
ENCORE		Blank	
Number of preserved bottles		Barium	
pH		pH	
LAB USE ONLY		LAB USE ONLY	
01		01	
02		02	
03		03	
1/31/12		1/31/12	
Comments / Special Instructions		Comments / Special Instructions	
Turnaround Time (Business days)		Approved By (Accutest PM): / Date:	
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day /# SH <input checked="" type="checkbox"/> 3 Day EMERGENCY <input checked="" type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY		<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)	
Emergency & Rush T/A data available VIA Lablink		<input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input checked="" type="checkbox"/> PDF	
Sample Custody must be documented below each time samples change possession, including courier delivery.		Commercial "A" = Results Only Commercial "B" = Results + QC Summary	
Relinquished by: <b>1/30/12 17:40</b>		Received By: <b>1/30/12</b>	
Relinquished by: <b>1/30/12</b>		Received By: <b>1/30/12</b>	
Relinquished by: <b>1/30/12</b>		Received By: <b>1/30/12</b>	
Relinquished by: <b>1/30/12</b>		Received By: <b>1/30/12</b>	
Relinquished by: <b>1/30/12</b>		Received By: <b>1/30/12</b>	
Custody Seal # <b>HD110</b>		Intact	
Not Intact		Preserved where applicable	
On Ice		Cooler Temp.	
4.5		4.5	

**D31468: Chain of Custody**

**Page 1 of 2**

## Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** D31468

**Client:** KRW CONSULTING INC.

**Immediate Client Services Action Required:** No

**Date / Time Received:** 1/31/2012 12:45:00 PM

**No. Coolers:** 1

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

**Project:** XTO FRU 297-20A

**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

## Metals Analysis

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### 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: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/31/12

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	0.18	<1.0
Beryllium	1.0	.044	.1		
Boron	5.0	.48	.48		
Cadmium	1.0	.027	.27		
Calcium	40	.96	1.1		
Chromium	1.0	.018	.031		
Cobalt	0.50	.035	.035		
Copper	1.0	.085	.16		
Iron	7.0	.34	2		
Lead	5.0	.16	.21		
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		
Phosphorus	10	1.1	1.2		
Potassium	200	5.5	9.2		
Selenium	5.0	.38	.5		
Silicon	5.0	.38	.51		
Silver	3.0	.018	.051		
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		

Associated samples MP6755: D31468-1, D31468-2

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

5.1.1

5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/31/12

Metal	D31412-1 Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	5510	6620	263	421.5(a)	75-125
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP6755: D31468-1, D31468-2

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



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
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: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/31/12

Metal	D31412-1 Original	MSD	Spikelot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	5510	6340	246	337.7(a)	4.3	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP6755: D31468-1, D31468-2

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
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.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/31/12

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	208	200	104.0	80-120
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP6755: D31468-1, D31468-2

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

5.1.3

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# SERIAL DILUTION RESULTS SUMMARY

Login Number: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

QC Batch ID: MP6755  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 01/31/12

Metal	D31412-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	44800	49100	9.5	0-10
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP6755: D31468-1, D31468-2

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

## 5.1.4



Methods: SW846 6010C  
Units: ug/l

Metal

(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: D31468  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-20A

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
pH	GN13495			su	8.00	8.05	100.6	99.3-100.7%

Associated Samples:  
Batch GN13495: D31468-1, D31468-2  
(\*) Outside of QC limits