



02/06/12

## Technical Report for

**XTO Energy**

**FRU 297-28C**

**1108-08A**

**Accutest Job Number: D31570**

**Sampling Date: 02/01/12**

### 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)

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

# Table of Contents

-1-

**Section 1: Sample Summary ..... 3**

**Section 2: Case Narrative/Conformance Summary ..... 4**

**Section 3: Sample Results ..... 5**

**3.1: D31570-1: RP\_MIX/BLEND\_10 ..... 6**

**3.2: D31570-2: RP\_MIX/BLEND\_11 ..... 8**

**Section 4: Misc. Forms ..... 10**

**4.1: Chain of Custody ..... 11**

**Section 5: Metals Analysis - QC Data Summaries ..... 13**

**5.1: Prep QC MP6780: Ba ..... 14**

**Section 6: General Chemistry - QC Data Summaries ..... 24**

**6.1: Method Blank and Spike Results Summary ..... 25**



Sample Summary

XTO Energy

Job No: D31570

FRU 297-28C

Project No: 1108-08A

Sample Number	Collected		Time By	Received	Matrix		Client Sample ID
	Date				Code	Type	
D31570-1	02/01/12	13:15	CH	02/02/12	SO	Soil	RP_MIX/BLEND_10
D31570-2	02/01/12	13:20	CH	02/02/12	SO	Soil	RP_MIX/BLEND_11

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

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy

**Job No** D31570

**Site:** FRU 297-28C

**Report Date** 2/6/2012 9:56:56 AM

On 02/02/2012, 2 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D31570 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:** MP6780

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D31568-1MSD, D31568-1SDL, D31568-1MS were used as the QC samples for the metals analysis.
- 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 serial dilution RPD(s) for Barium are outside control limits for sample MP6780-SD1. Probable cause due to sample homogeneity.
- MP6780-SD1 for Barium: Serial dilution indicates possible matrix interference.

### Wet Chemistry By Method SM19 2540B M

**Matrix** SO

**Batch ID:** GN13539

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

### Wet Chemistry By Method SW846 9045C

**Matrix** SO

**Batch ID:** GN13543

- The following sample was run outside of holding time for method SW846 9045C: D31570-1, D31570-2

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

<b>Client Sample ID:</b>	RP_MIX/BLEND_10	<b>Date Sampled:</b>	02/01/12
<b>Lab Sample ID:</b>	D31570-1	<b>Date Received:</b>	02/02/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.9
<b>Project:</b>	FRU 297-28C		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	5310	5.9	mg/kg	5	02/03/12	02/03/12 JB	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA2162  
(2) Prep QC Batch: MP6780

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	RP_MIX/BLEND_10	<b>Date Sampled:</b>	02/01/12
<b>Lab Sample ID:</b>	D31570-1	<b>Date Received:</b>	02/02/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.9
<b>Project:</b>	FRU 297-28C		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	86.9		%	1	02/03/12	SWT	SM19 2540B M
pH	10.91		su	1	02/03/12 10:15	CT	SW846 9045C

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	RP_MIX/BLEND_11	<b>Date Sampled:</b>	02/01/12
<b>Lab Sample ID:</b>	D31570-2	<b>Date Received:</b>	02/02/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.9
<b>Project:</b>	FRU 297-28C		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	5640	6.4	mg/kg	5	02/03/12	02/03/12 JB	SW846 6010C <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA2162  
(2) Prep QC Batch: MP6780

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	RP_MIX/BLEND_11	<b>Date Sampled:</b>	02/01/12
<b>Lab Sample ID:</b>	D31570-2	<b>Date Received:</b>	02/02/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	80.9
<b>Project:</b>	FRU 297-28C		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	80.9		%	1	02/03/12	SWT	SM19 2540B M
pH	10.83		su	1	02/03/12 10:15	CT	SW846 9045C

RL = Reporting Limit

## Misc. Forms

---

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

**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

D31570

PAGE 1 OF 1

<b>Client / Reporting Information</b> Company Name: <b>KRW Consulting Inc</b> Street Address: <b>8000 W. 14th Ave Ste. 200</b> City: <b>Lakewood CO 80214</b> Project Contact: <b>Dwayne Knudson</b> Phone #: <b>303 239 9011</b> Fax #: <b>303 239 9011</b> Computer(s) Name(s): <b>C:\Hollister.303.585.9365</b> Phone #: <b>303 239 9011</b>		<b>Project Information</b> Project Name: <b>XTO - FRU - 297 - 28C</b> Street: <b>XTO Energy</b> City: <b>Rifle CO</b> Project#: <b>1108-08A</b> Client PO#: <b>21459 CR5</b> Project Manager: <b>Joe Hess</b> Attention: <b>Jessica Pooling</b>		<b>Requested Analysis (see TEST CODE sheet)</b> Matrix Codes: DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
<b>Accutest Sample #</b> Field ID / Point of Collection: <b>RP Mix Blend - 10</b> <b>RP Mix Blend - 11</b>		<b>Collection</b> Date: <b>2/1/12</b> Time: <b>13:15</b> Sampled by: <b>CH</b> Matrix: <b>SO</b> # of bottles: <b>2</b>		<b>Number of preserved bottles</b> HCl: <input checked="" type="checkbox"/> HNO3: <input checked="" type="checkbox"/> H2SO4: <input checked="" type="checkbox"/> NONE: <input checked="" type="checkbox"/> BY Water: <input checked="" type="checkbox"/> MCH: <input checked="" type="checkbox"/> ENCORE: <input checked="" type="checkbox"/> Blank/late: <input checked="" type="checkbox"/>	
<b>LAB USE ONLY</b> 01 02 DR 2/2					
<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 RW SH <input checked="" type="checkbox"/> 5 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush TIA data available VIA Lablink		<b>Approved By (Accutest PM): / Date:</b> _____ _____ _____ _____ _____		<b>Data Deliverable Information</b> <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> State Forms <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> EDD Format <input type="checkbox"/> Commercial "B" - Narrative <input checked="" type="checkbox"/> PDF <input type="checkbox"/> FULLT1 (Level 3+4) Commercial "A" = Results Only Commercial "B" = Results + QC Summary	
<b>Comments / Special Instructions</b> Please email results to KRW Piceance Creek Team					
<b>Sample Custody must be documented below each time samples change possession, including courier delivery.</b>					
Relinquished by Sampler: <b>Chris Hollister</b> Date Time: <b>2/1/12 1:00</b>		Received By: <b>Rifle Service Center</b> Date Time: <b>2/1/12 13:50</b>		Relinquished By: <b>CS</b> Date Time: <b>2/1/12</b>	
Relinquished by Sampler: <b>3</b> Date Time: <b>2/1/12</b>		Received By: <b>3</b> Date Time: <b>2/1/12</b>		Relinquished By: <b>4</b> Date Time: <b>2/1/12</b>	
Relinquished by: <b>5</b> Date Time: <b>2/1/12</b>		Received By: <b>5</b> Date Time: <b>2/1/12</b>		Custody Seal #: <b>H01/LO</b> <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact Preserved where applicable: <input checked="" type="checkbox"/> On Ice: <input checked="" type="checkbox"/> Cooler Temp: <b>4.0</b>	

**D31570: Chain of Custody**

**Page 1 of 2**

# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D31570

Client: KRW CONSULTING INC.

Immediate Client Services Action Required: No

Date / Time Received: 2/2/2012 1:50:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XTO FRU 297-28C

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

5

### QC Data Summaries

---

Includes the following where applicable:

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/03/12

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	0.12	<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 MP6780: D31570-1, D31570-2

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
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: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/03/12

Metal	D31568-1 Original MS	Spikelot MPICPALL % Rec	QC Limits
Aluminum			
Antimony			
Arsenic	anr		
Barium	3050 5550	221	1131.2(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 MP6780: D31570-1, D31570-2

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



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
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: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/03/12

Metal	D31568-1 Original	MSD	Spikelot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	3050	5140	217	964.4(a)	7.7	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 MP6780: D31570-1, D31570-2

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
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: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 02/03/12

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	204	200	102.0	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 MP6780: D31570-1, D31570-2

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

5.1.3

5

# SERIAL DILUTION RESULTS SUMMARY

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 02/03/12

Metal	D31568-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	26900	34000	16.2*(a)	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 MP6780: D31570-1, D31570-2

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

QC Batch ID: MP6780  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date:

Metal

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

5.1.4

5

## 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: D31570  
Account: XTOKRWR - XTO Energy  
Project: FRU 297-28C

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
pH	GN13543			su	8.00	8.02	100.3	99.3-100.7%

Associated Samples:  
Batch GN13543: D31570-1, D31570-2  
(\*) Outside of QC limits

6.1  
6