



11/18/11

**Technical Report for**

**KRW Consulting, Inc.**

**XOM FRU 297-28C**

**1108-08A**

**Accutest Job Number: D29515**

**Sampling Date: 11/15/11**

**Report to:**

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**Total number of pages in report: 20**



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: 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

KRW Consulting, Inc.

**Job No:** D29515

XOM FRU 297-28C  
 Project No: 1108-08A

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D29515-1	11/15/11	10:15 CB	11/16/11	SO	Soil	2ND DEEP BACKGROUND 1
D29515-2	11/15/11	10:35 CB	11/16/11	SO	Soil	2ND DEEP BACKGROUND 2
D29515-3	11/15/11	10:30 CB	11/16/11	SO	Soil	2ND DEEP BACKGROUND 3
D29515-4	11/15/11	11:30 CB	11/16/11	SO	Soil	2ND DEEP BACKGROUND 4
D29515-5	11/15/11	11:50 CB	11/16/11	SO	Soil	2ND DEEP BACKGROUND 5
D29515-6	11/15/11	11:55 CB	11/16/11	SO	Soil	2ND DEEP BACKGROUND 6

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

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** KRW Consulting, Inc.

**Job No** D29515

**Site:** XOM FRU 297-28C

**Report Date** 11/18/2011 10:45:00 A

On 11/16/2011, 6 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 D29515 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 6020

**Matrix** SO

**Batch ID:** MP6287

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D29461-1MS, D29461-1MSD, D29461-1SDL were used as the QC samples for the metals analysis.
- 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 MP6287-SD1. Probable cause due to sample homogeneity.
- MP6287-SD1 for Arsenic: Serial dilution indicates possible matrix interference.

### Wet Chemistry By Method SM19 2540B M

**Matrix** SO

**Batch ID:** GN12539

- 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

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Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> 2ND DEEP BACKGROUND 1	<b>Date Sampled:</b> 11/15/11
<b>Lab Sample ID:</b> D29515-1	<b>Date Received:</b> 11/16/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.0
<b>Project:</b> XOM FRU 297-28C	

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1.3	0.42	mg/kg	5	11/16/11	11/17/11 GJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA1980

(2) Prep QC Batch: MP6287

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RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> 2ND DEEP BACKGROUND 2	<b>Date Sampled:</b> 11/15/11
<b>Lab Sample ID:</b> D29515-2	<b>Date Received:</b> 11/16/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.4
<b>Project:</b> XOM FRU 297-28C	

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2.0	0.48	mg/kg	5	11/16/11	11/17/11 GJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA1980

(2) Prep QC Batch: MP6287

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RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> 2ND DEEP BACKGROUND 3	<b>Date Sampled:</b> 11/15/11
<b>Lab Sample ID:</b> D29515-3	<b>Date Received:</b> 11/16/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.3
<b>Project:</b> XOM FRU 297-28C	

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.2	0.44	mg/kg	5	11/16/11	11/17/11 GJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA1980

(2) Prep QC Batch: MP6287

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RL = Reporting Limit

## Report of Analysis

3.4  
3

<b>Client Sample ID:</b> 2ND DEEP BACKGROUND 4	<b>Date Sampled:</b> 11/15/11
<b>Lab Sample ID:</b> D29515-4	<b>Date Received:</b> 11/16/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.1
<b>Project:</b> XOM FRU 297-28C	

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	1.5	0.48	mg/kg	5	11/16/11	11/17/11 GJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA1980

(2) Prep QC Batch: MP6287

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RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> 2ND DEEP BACKGROUND 5	<b>Date Sampled:</b> 11/15/11
<b>Lab Sample ID:</b> D29515-5	<b>Date Received:</b> 11/16/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.4
<b>Project:</b> XOM FRU 297-28C	

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2.7	0.40	mg/kg	5	11/16/11	11/17/11 GJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA1980

(2) Prep QC Batch: MP6287

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RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> 2ND DEEP BACKGROUND 6	<b>Date Sampled:</b> 11/15/11
<b>Lab Sample ID:</b> D29515-6	<b>Date Received:</b> 11/16/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.8
<b>Project:</b> XOM FRU 297-28C	

### Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2.4	0.40	mg/kg	5	11/16/11	11/17/11 GJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA1980

(2) Prep QC Batch: MP6287

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RL = Reporting Limit

## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D29515

Client: KRW

Immediate Client Services Action Required: No

Date / Time Received: 11/16/2011 12:00:00 P

No. Coolers: 1

Client Service Action Required at Login: No

Project: XOM

Airbill #'s: CO

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
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"/>

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

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

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
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"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
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	

<u>Sample Integrity - Instructions</u>	<u>Y or N</u>		<u>N/A</u>
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

4.1  
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## 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: D29515  
Account: KRWCCOL - KRW Consulting, Inc.  
Project: XOM FRU 297-28C

QC Batch ID: MP6287  
Matrix Type: SOLID

Methods: SW846 6020  
Units: mg/kg

Prep Date: 11/16/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.2		
Antimony	0.20	.001	.0095		
Arsenic	0.40	.049	.22	0.12	<0.40
Barium	1.0	.0035	.1		
Beryllium	0.10	.0075	.014		
Boron	20	.97	1		
Cadmium	0.050	.023	.048		
Calcium	200	1.8	8.2		
Chromium	1.0	.021	.24		
Cobalt	0.10	.0033	.003		
Copper	1.0	.011	.063		
Iron	20	.81	3.7		
Lead	0.25	.0012	.015		
Magnesium	50	.067	2.6		
Manganese	0.50	.007	.029		
Molybdenum	0.50	.0044	.023		
Nickel	1.0	.0029	.031		
Phosphorus	30	1.8	3.5		
Potassium	100	2	3.2		
Selenium	0.20	.075	.19		
Silver	0.050	.0008	.002		
Sodium	250	.8	4.4		
Strontium	10	.004	.04		
Thallium	0.10	.015	.02		
Tin	5.0	.006	.028		
Titanium	1.0	.035	.062		
Uranium	0.25	.00038	.0009		
Vanadium	2.0	.052	.29		
Zinc	5.0	.039	.12		

Associated samples MP6287: D29515-1, D29515-2, D29515-3, D29515-4, D29515-5, D29515-6

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: D29515  
 Account: KRWCCOL - KRW Consulting, Inc.  
 Project: XOM FRU 297-28C

QC Batch ID: MP6287  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 11/16/11

Metal	D29461-1 Original MS		SpikeLot MPICPALL % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	9.0	115	132	80.3 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 MP6287: D29515-1, D29515-2, D29515-3, D29515-4, D29515-5, D29515-6

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

5.1.2  
**5**

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D29515  
 Account: KRWCCOL - KRW Consulting, Inc.  
 Project: XOM FRU 297-28C

QC Batch ID: MP6287  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 11/16/11

Metal	D29461-1 Original MSD		SpikeLot MPICPALL % Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	9.0	95.1	118	73.2N(a) 18.9	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 MP6287: D29515-1, D29515-2, D29515-3, D29515-4, D29515-5, D29515-6

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 and/or sample nonhomogeneity.

5.1.2  
**5**

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D29515  
 Account: KRWCCOL - KRW Consulting, Inc.  
 Project: XOM FRU 297-28C

QC Batch ID: MP6287  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 11/16/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	95.5	100	95.5	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 MP6287: D29515-1, D29515-2, D29515-3, D29515-4, D29515-5, D29515-6

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D29515  
 Account: KRWCCOL - KRW Consulting, Inc.  
 Project: XOM FRU 297-28C

QC Batch ID: MP6287  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: ug/l

Prep Date: 11/16/11

Metal	D29461-1	QC
	Original	Limits

Metal	Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	68.3	59.9	12.3*(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 MP6287: D29515-1, D29515-2, D29515-3, D29515-4, D29515-5, D29515-6

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested  
 (a) Serial dilution indicates possible matrix interference.

5.1.4  
**5**