



11/23/11

Technical Report for

KRW Consulting, Inc.

XOM FRU 297-20A

1108-10A

Accutest Job Number: D29648

Sampling Date: 11/18/11

Report to:

KRW Consulting, Inc.
8000 West 14th Avenue Suite 200
Lakewood, CO 80214
cburger@krwconsulting.com; gknell@krwconsulting.com;
dknudson@krwconsulting.com; jhess@krwconsulting.com;
ATTN: Dwayne Knudson

Total number of pages in report: 19



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: D29648

XOM FRU 297-20A
Project No: 1108-10A

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D29648-1	11/18/11	10:30 CB	11/19/11	SO	Soil	BACKGROUND 1
D29648-2	11/18/11	10:35 CB	11/19/11	SO	Soil	BACKGROUND 2
D29648-3	11/18/11	10:40 CB	11/19/11	SO	Soil	BACKGROUND 3
D29648-4	11/18/11	10:45 CB	11/19/11	SO	Soil	BACKGROUND 4
D29648-5	11/18/11	10:50 CB	11/19/11	SO	Soil	BACKGROUND 5

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: KRW Consulting, Inc.

Job No D29648

Site: XOM FRU 297-20A

Report Dat 11/23/2011 9:56:46 AM

On 11/19/2011, 5 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D29648 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: MP6322

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D29629-1MS, D29629-1MSD, D29629-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP6322-SD1. Serial dilution indicates possible matrix interference.

Wet Chemistry By Method SM19 2540B M

Matrix SO

Batch ID: GN12618

- 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:	BACKGROUND 1	Date Sampled:	11/18/11
Lab Sample ID:	D29648-1	Date Received:	11/19/11
Matrix:	SO - Soil	Percent Solids:	80.4
Project:	XOM FRU 297-20A		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.3	0.50	mg/kg	5	11/21/11	11/22/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1995
(2) Prep QC Batch: MP6322

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BACKGROUND 2	Date Sampled:	11/18/11
Lab Sample ID:	D29648-2	Date Received:	11/19/11
Matrix:	SO - Soil	Percent Solids:	87.4
Project:	XOM FRU 297-20A		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.2	0.48	mg/kg	5	11/21/11	11/22/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1995
(2) Prep QC Batch: MP6322

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BACKGROUND 3	Date Sampled:	11/18/11
Lab Sample ID:	D29648-3	Date Received:	11/19/11
Matrix:	SO - Soil	Percent Solids:	91.0
Project:	XOM FRU 297-20A		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.9	0.43	mg/kg	5	11/21/11	11/22/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1995
(2) Prep QC Batch: MP6322

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BACKGROUND 4	Date Sampled:	11/18/11
Lab Sample ID:	D29648-4	Date Received:	11/19/11
Matrix:	SO - Soil	Percent Solids:	92.8
Project:	XOM FRU 297-20A		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.5	0.42	mg/kg	5	11/21/11	11/22/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1995
(2) Prep QC Batch: MP6322

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BACKGROUND 5	Date Sampled:	11/18/11
Lab Sample ID:	D29648-5	Date Received:	11/19/11
Matrix:	SO - Soil	Percent Solids:	91.3
Project:	XOM FRU 297-20A		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8.5	0.43	mg/kg	5	11/21/11	11/22/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1995
(2) Prep QC Batch: MP6322

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

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

[illegible]

4.1

D29648: Chain of Custody

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Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D29648

Client: KRW CONSULTING INC.

Immediate Client Services Action Required: No

Date / Time Received: 11/19/2011 9:00:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XOM FRU 297-20A

Airbill #'s: Fedex

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

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

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www.accutest.com

D29648: Chain of Custody
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Metals Analysis

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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: D29648
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-20A

QC Batch ID: MP6322
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 11/21/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.2		
Antimony	0.20	.001	.0095		
Arsenic	0.40	.049	.22	0.14	<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 MP6322: D29648-1, D29648-2, D29648-3, D29648-4, D29648-5

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: D29648
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-20A

QC Batch ID: MP6322
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 11/21/11

Metal	D29629-1 Original MS	Spikelot MPICPALL % Rec	QC Limits
Aluminum			
Antimony			
Arsenic	4.6	117	112 99.9 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 MP6322: D29648-1, D29648-2, D29648-3, D29648-4, D29648-5

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: D29648
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-20A

QC Batch ID: MP6322
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 11/21/11

Metal	D29629-1 Original	MSD	Spikelot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	4.6	127	119	102.6	8.2	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 MP6322: D29648-1, D29648-2, D29648-3, D29648-4, D29648-5

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: D29648
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-20A

QC Batch ID: MP6322
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 11/21/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	104	100	104.0	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 MP6322: D29648-1, D29648-2, D29648-3, D29648-4, D29648-5

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D29648
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-20A

QC Batch ID: MP6322
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 11/21/11

Metal	D29629-1 Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	39.7	46.6	17.2*(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 MP6322: D29648-1, D29648-2, D29648-3, D29648-4, D29648-5

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