



01/10/12

Technical Report for

KRW Consulting, Inc.

XOM FRU 297-28C

1108-08A

Accutest Job Number: D30796

Sampling Date: 01/04/12


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: 75



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)

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	8
3.1: D30796-1: RP SUBLINER	9
3.2: D30796-1A: RP SUBLINER	15
Section 4: Misc. Forms	17
4.1: Chain of Custody	18
Section 5: GC/MS Volatiles - QC Data Summaries	20
5.1: Method Blank Summary	21
5.2: Blank Spike Summary	22
5.3: Matrix Spike/Matrix Spike Duplicate Summary	24
Section 6: GC/MS Semi-volatiles - QC Data Summaries	26
6.1: Method Blank Summary	27
6.2: Blank Spike Summary	28
6.3: Matrix Spike/Matrix Spike Duplicate Summary	29
Section 7: GC Volatiles - QC Data Summaries	30
7.1: Method Blank Summary	31
7.2: Blank Spike Summary	32
7.3: Matrix Spike/Matrix Spike Duplicate Summary	33
Section 8: GC Semi-volatiles - QC Data Summaries	34
8.1: Method Blank Summary	35
8.2: Blank Spike Summary	36
8.3: Matrix Spike/Matrix Spike Duplicate Summary	37
Section 9: Metals Analysis - QC Data Summaries	38
9.1: Prep QC MP6610: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn	39
9.2: Prep QC MP6611: As	49
9.3: Prep QC MP6612: Ca,Mg,Na,Sodium Adsorption Ratio	54
9.4: Prep QC MP6625: Hg	62
Section 10: General Chemistry - QC Data Summaries	66
10.1: Method Blank and Spike Results Summary	67
10.2: Duplicate Results Summary	68
Section 11: Misc. Forms (Accutest Labs of New England, Inc.)	69
11.1: Chain of Custody	70
Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.)	72
12.1: Method Blank and Spike Results Summary	73
12.2: Duplicate Results Summary	74
12.3: Matrix Spike Results Summary	75



Sample Summary

KRW Consulting, Inc.

Job No: D30796

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

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D30796-1	01/04/12	10:30 DS	01/05/12	SO	Soil	RP SUBLINER
D30796-1A	01/04/12	10:30 DS	01/05/12	SO	Soil	RP SUBLINER

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: KRW Consulting, Inc.

Job No D30796

Site: XOM FRU 297-28C

Report Date 1/10/2012 4:28:40 PM

On 01/05/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.3 °C. The sample was intact and properly preserved, unless noted below. An AMS Job Number of D30796 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

Matrix SO	Batch ID: V5V1118
------------------	--------------------------

- The sample was analyzed within the recommended method holding time.
- Sample(s) D30796-1MS, D30796-1MSD 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

Matrix SO	Batch ID: OP5109
------------------	-------------------------

- The sample was extracted and analyzed within the recommended method holding time.
- Sample(s) D30800-1MS, D30800-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB820
------------------	-------------------------

- The sample was analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30796-1MS, D30796-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP5105
------------------	-------------------------

- The sample was extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30779-3MS, D30779-3MSD were used as the QC samples indicated.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Metals By Method SW846 6010C

Matrix AQ

Batch ID: MP6612

- The sample was digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30797-1AMS, D30797-1AMSD were used as the QC samples for the metals analysis.

Matrix SO

Batch ID: MP6610

- The sample was digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30796-1MS, D30796-1MSD, D30796-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Barium are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- The serial dilution RPD(s) for Cadmium, Selenium, Silver, Barium, Copper, Lead, Nickel, Zinc are outside control limits for sample MP6610-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP6610-SD1 for Barium: Serial dilution indicates possible matrix interference and/or sample nonhomogeneity.
- MP6610-SD1 for Copper, Lead, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix SO

Batch ID: MP6611

- The sample was digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30796-1MS, D30796-1MSD, D30796-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP6611-SD1. Probable cause due to sample homogeneity.
- MP6611-SD1 for Arsenic: Serial dilution indicates possible matrix interference.

Metals By Method SW846 7471B

Matrix SO

Batch ID: MP6625

- The sample was digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30793-1MS, D30793-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix SO

Batch ID: GN13150

- Sample(s) D30796-1DUP 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: GP6259

- The sample was 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: GN13148

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

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO

Batch ID: R11382

- The data for SW846 3060/7196A M meets quality control requirements.
- D30796-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: M:GP14024

- The data for SW846 3060A/7196A meets quality control requirements.
- D30796-1 for Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method USDA HANDBOOK 60

Matrix SO

Batch ID: MP6612

- D30796-1A 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 DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D30796

Site: KRWCCOL: XOM FRU 297-28C

Report Date 1/10/2012 3:34:35 PM

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 01/04/2012 and were received at Accutest on 01/05/2012 properly preserved, at 1.3 Deg. C and intact. These Samples received an Accutest job number of D30796. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP14024

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D30796-1DUP, D30796-1MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D30796).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	RP SUBLINER	Date Sampled:	01/04/12
Lab Sample ID:	D30796-1	Date Received:	01/05/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8260B		
Project:	XOM FRU 297-28C		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V18681.D	1	01/08/12	KV	n/a	n/a	V5V1118
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.05 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.064	0.028	mg/kg	
108-88-3	Toluene	ND	0.13	0.064	mg/kg	
100-41-4	Ethylbenzene	ND	0.13	0.032	mg/kg	
1330-20-7	Xylene (total)	ND	0.25	0.13	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	87%		61-130%
460-00-4	4-Bromofluorobenzene	80%		53-131%
17060-07-0	1,2-Dichloroethane-D4	102%		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:	RP SUBLINER	Date Sampled:	01/04/12
Lab Sample ID:	D30796-1	Date Received:	01/05/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8270C BY SIM SW846 3546		
Project:	XOM FRU 297-28C		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G07477.D	1	01/05/12	DC	01/05/12	OP5109	E3G280
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 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	0.0076	0.0061	mg/kg	
120-12-7	Anthracene	ND	0.0076	0.0068	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.019	0.0099	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.019	0.014	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.019	0.014	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.019	0.0084	mg/kg	
218-01-9	Chrysene	ND	0.019	0.0084	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.019	0.014	mg/kg	
206-44-0	Fluoranthene	ND	0.0076	0.0076	mg/kg	
86-73-7	Fluorene	ND	0.0076	0.0065	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.023	0.021	mg/kg	
91-20-3	Naphthalene	ND	0.0076	0.0072	mg/kg	
129-00-0	Pyrene	ND	0.0076	0.0072	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	62%		10-145%
321-60-8	2-Fluorobiphenyl	62%		10-130%
1718-51-0	Terphenyl-d14	69%		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:	RP SUBLINER	Date Sampled:	01/04/12
Lab Sample ID:	D30796-1	Date Received:	01/05/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8015B		
Project:	XOM FRU 297-28C		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB14496.D	1	01/05/12	SK	n/a	n/a	GGB820
Run #2							

	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	13	6.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	102%		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:	RP SUBLINER	Date Sampled:	01/04/12
Lab Sample ID:	D30796-1	Date Received:	01/05/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846-8015B SW846 3546		
Project:	XOM FRU 297-28C		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD12689.D	1	01/05/12	TR	01/05/12	OP5105	GFD657
Run #2							

	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)	11.9	15	9.9	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	73%		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: RP SUBLINER

Lab Sample ID: D30796-1

Matrix: SO - Soil

Date Sampled: 01/04/12

Date Received: 01/05/12

Percent Solids: 87.6

Project: XOM FRU 297-28C

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.3	0.45	mg/kg	5	01/06/12	01/09/12 GJ	SW846 6020A ²	SW846 3050B ⁵
Barium	691	1.1	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Cadmium	< 1.1	1.1	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Chromium	37.7	1.1	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Copper	5.6	1.1	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Lead	9.9	5.6	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Mercury	< 0.12	0.12	mg/kg	1	01/10/12	01/10/12 JB	SW846 7471B ³	SW846 7471B ⁶
Nickel	12.6	3.4	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Selenium	< 5.6	5.6	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Silver	< 3.4	3.4	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴
Zinc	37.0	3.4	mg/kg	1	01/06/12	01/06/12 JB	SW846 6010C ¹	SW846 3050B ⁴

(1) Instrument QC Batch: MA2098

(2) Instrument QC Batch: MA2100

(3) Instrument QC Batch: MA2102

(4) Prep QC Batch: MP6610

(5) Prep QC Batch: MP6611

(6) Prep QC Batch: MP6625

RL = Reporting Limit

Report of Analysis

Client Sample ID: RP SUBLINER
Lab Sample ID: D30796-1
Matrix: SO - Soil
Project: XOM FRU 297-28C

Date Sampled: 01/04/12
Date Received: 01/05/12
Percent Solids: 87.6

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.57	0.45	mg/kg	1	01/09/12 15:39	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	37.1	1.6	mg/kg	1	01/09/12 15:39	AMA	SW846 3060/7196A M
Redox Potential Vs H2	394		mv	1	01/05/12	JD	ASTM D1498-76M
Solids, Percent	87.6		%	1	01/05/12	SWT	SM19 2540B M
Specific Conductivity	649	1.0	umhos/cm	1	01/06/12	JK	DEPT.OF AG, BOOK N9
pH	10.17		su	1	01/05/12 14:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	RP SUBLINER	Date Sampled:	01/04/12
Lab Sample ID:	D30796-1A	Date Received:	01/05/12
Matrix:	SO - Soil	Percent Solids:	87.6
Project:	XOM FRU 297-28C		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	10.7	2.0	mg/l	1	01/06/12	01/06/12 JB	SW846 6010C ¹	EPA 200.7 ²
Magnesium	4.28	1.0	mg/l	1	01/06/12	01/06/12 JB	SW846 6010C ¹	EPA 200.7 ²
Sodium	111	2.0	mg/l	1	01/06/12	01/06/12 JB	SW846 6010C ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA2098
(2) Prep QC Batch: MP6612

RL = Reporting Limit

Report of Analysis

Client Sample ID:	RP SUBLINER	Date Sampled:	01/04/12
Lab Sample ID:	D30796-1A	Date Received:	01/05/12
Matrix:	SO - Soil	Percent Solids:	87.6
Project:	XOM FRU 297-28C		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.25		ratio	1	01/06/12 14:58	JB	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

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D30796

Client: KRW CONSULTING

Immediate Client Services Action Required: No

Date / Time Received: 1/5/2012 11:45:00 AM

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

GC/MS Volatiles

5

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: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1118-MB	5V18676.D	1	01/08/12	KV	n/a	n/a	V5V1118

The QC reported here applies to the following samples:

Method: SW846 8260B

D30796-1

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	105% 61-130%
460-00-4	4-Bromofluorobenzene	89% 53-131%
17060-07-0	1,2-Dichloroethane-D4	125% 62-130%

Blank Spike Summary

Page 1 of 1

Job Number: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1118-BS	5V18677.D	1	01/08/12	KV	n/a	n/a	V5V1118

The QC reported here applies to the following samples:

Method: SW846 8260B

D30796-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	60.5	121	70-130
100-41-4	Ethylbenzene	50	56.4	113	70-130
108-88-3	Toluene	50	52.4	105	70-130
1330-20-7	Xylene (total)	150	180	120	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	109%	61-130%
460-00-4	4-Bromofluorobenzene	111%	53-131%
17060-07-0	1,2-Dichloroethane-D4	118%	62-130%

Blank Spike Summary

Job Number: D30796
Account: KRWCCOL KRW Consulting, Inc.
Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1118-BS	5V18678.D	1	01/08/12	KV	n/a	n/a	V5V1118

The QC reported here applies to the following samples:

Method: SW846 8260B

D30796-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
---------	----------	----------------	--------------	----------	--------

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	98%	61-130%
460-00-4	4-Bromofluorobenzene	89%	53-131%
17060-07-0	1,2-Dichloroethane-D4	105%	62-130%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D30796-1MS	5V18682.D	1	01/08/12	KV	n/a	n/a	V5V1118
D30796-1MSD	5V18683.D	1	01/08/12	KV	n/a	n/a	V5V1118
D30796-1	5V18681.D	1	01/08/12	KV	n/a	n/a	V5V1118

The QC reported here applies to the following samples:

Method: SW846 8260B

D30796-1

CAS No.	Compound	D30796-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		3180	3500	110	3620	114	3	70-134/30
100-41-4	Ethylbenzene	ND		3180	3310	104	3480	109	5	70-137/30
108-88-3	Toluene	ND		3180	2950	93	3060	96	4	70-130/30
1330-20-7	Xylene (total)	ND		9540	11200	117	11400	119	2	61-131/30

CAS No.	Surrogate Recoveries	MS	MSD	D30796-1	Limits
2037-26-5	Toluene-D8	96%	88%	87%	61-130%
460-00-4	4-Bromofluorobenzene	113%	106%	80%	53-131%
17060-07-0	1,2-Dichloroethane-D4	113%	105%	102%	62-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D30796
Account: KRWCCOL KRW Consulting, Inc.
Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D30796-1MS	5V18684.D	1	01/08/12	KV	n/a	n/a	V5V1118
D30796-1MSD	5V18685.D	1	01/08/12	KV	n/a	n/a	V5V1118
D30796-1	5V18681.D	1	01/08/12	KV	n/a	n/a	V5V1118

The QC reported here applies to the following samples:

Method: SW846 8260B

D30796-1

CAS No.	Compound	D30796-1 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
---------	----------	-------------------	------------	-------	-------------	---------	--------------	----------	-----	-------------------

CAS No.	Surrogate Recoveries	MS	MSD	D30796-1	Limits
2037-26-5	Toluene-D8	91%	91%	87%	61-130%
460-00-4	4-Bromofluorobenzene	94%	93%	80%	53-131%
17060-07-0	1,2-Dichloroethane-D4	105%	99%	102%	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: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5109-MB	3G07472.D	1	01/05/12	DC	01/05/12	OP5109	E3G280

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D30796-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	6.7	5.3	ug/kg	
120-12-7	Anthracene	ND	6.7	6.0	ug/kg	
56-55-3	Benzo(a)anthracene	ND	17	8.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	17	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	17	12	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	17	7.3	ug/kg	
218-01-9	Chrysene	ND	17	7.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	17	12	ug/kg	
206-44-0	Fluoranthene	ND	6.7	6.7	ug/kg	
86-73-7	Fluorene	ND	6.7	5.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	20	18	ug/kg	
91-20-3	Naphthalene	ND	6.7	6.3	ug/kg	
129-00-0	Pyrene	ND	6.7	6.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
4165-60-0	Nitrobenzene-d5	86% 10-145%
321-60-8	2-Fluorobiphenyl	83% 10-130%
1718-51-0	Terphenyl-d14	93% 22-130%

Blank Spike Summary

Page 1 of 1

Job Number: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5109-BS	3G07473.D	1	01/05/12	DC	01/05/12	OP5109	E3G280

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D30796-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	65.6	79	34-130
120-12-7	Anthracene	83.3	73.5	88	35-130
56-55-3	Benzo(a)anthracene	83.3	68.8	83	36-130
50-32-8	Benzo(a)pyrene	83.3	59.0	71	36-130
205-99-2	Benzo(b)fluoranthene	83.3	66.4	80	35-130
207-08-9	Benzo(k)fluoranthene	83.3	64.2	77	37-130
218-01-9	Chrysene	83.3	70.0	84	40-130
53-70-3	Dibenzo(a,h)anthracene	83.3	62.2	75	32-130
206-44-0	Fluoranthene	83.3	66.4	80	38-130
86-73-7	Fluorene	83.3	71.3	86	35-130
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	71.7	86	28-130
91-20-3	Naphthalene	83.3	64.5	77	35-130
129-00-0	Pyrene	83.3	75.4	90	37-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	79%	10-145%
321-60-8	2-Fluorobiphenyl	73%	10-130%
1718-51-0	Terphenyl-d14	82%	22-130%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D30796
Account: KRWCCOL KRW Consulting, Inc.
Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5109-MS	3G07475.D	4	01/05/12	DC	01/05/12	OP5109	E3G280
OP5109-MSD	3G07476.D	4	01/05/12	DC	01/05/12	OP5109	E3G280
D30800-1	3G07480.D	1	01/05/12	DC	01/05/12	OP5109	E3G280

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D30796-1

CAS No.	Compound	D30800-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		90.2	66.4	74	68.0	75	2	10-155/30
120-12-7	Anthracene	ND		90.2	79.0	88	82.9	92	5	10-155/30
56-55-3	Benzo(a)anthracene	ND		90.2	89.7	99	92.3	102	3	10-175/30
50-32-8	Benzo(a)pyrene	ND		90.2	78.6	87	82.5	92	5	10-164/30
205-99-2	Benzo(b)fluoranthene	ND		90.2	86.1	95	90.5	100	5	10-165/30
207-08-9	Benzo(k)fluoranthene	ND		90.2	67.9	75	66.1	73	3	10-178/30
218-01-9	Chrysene	ND		90.2	70.9	79	74.5	83	5	10-147/30
53-70-3	Dibenzo(a,h)anthracene	ND		90.2	74.2	82	76.9	85	4	10-144/30
206-44-0	Fluoranthene	ND		90.2	82.9	92	90.7	101	9	10-207/30
86-73-7	Fluorene	ND		90.2	79.7	88	85.6	95	7	10-163/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		90.2	88.1	98	92.4	103	5	10-180/30
91-20-3	Naphthalene	20.7		90.2	92.7	80	95.0	82	2	10-198/30
129-00-0	Pyrene	ND		90.2	75.1	83	78.6	87	5	10-189/30

CAS No.	Surrogate Recoveries	MS	MSD	D30800-1	Limits
4165-60-0	Nitrobenzene-d5	60%	61%	49%	10-145%
321-60-8	2-Fluorobiphenyl	71%	71%	50%	10-130%
1718-51-0	Terphenyl-d14	73%	77%	61%	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: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB820-MB	GB14494.D	1	01/05/12	SK	n/a	n/a	GGB820

The QC reported here applies to the following samples:

Method: SW846 8015B

D30796-1

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

Page 1 of 1

Job Number: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB820-BS	GB14495.D	1	01/05/12	SK	n/a	n/a	GGB820

The QC reported here applies to the following samples:

Method: SW846 8015B

D30796-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	115	105	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	115%	60-140%

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D30796
Account: KRWCCOL KRW Consulting, Inc.
Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D30796-1MS	GB14497.D	1	01/05/12	SK	n/a	n/a	GGB820
D30796-1MSD	GB14498.D	1	01/05/12	SK	n/a	n/a	GGB820
D30796-1	GB14496.D	1	01/05/12	SK	n/a	n/a	GGB820

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

D30796-1

CAS No.	Compound	D30796-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		140	143	102	146	104	2	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D30796-1	Limits
120-82-1	1,2,4-Trichlorobenzene	110%	113%	102%	60-140%

GC 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: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5105-MB	FD12670.D	1	01/05/12	TR	01/05/12	OP5105	GFD657

The QC reported here applies to the following samples:

Method: SW846-8015B

D30796-1

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	96% 43-136%

8.1.1

8

Blank Spike Summary

Page 1 of 1

Job Number: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5105-BS	FD12671.D	1	01/05/12	TR	01/05/12	OP5105	GFD657

The QC reported here applies to the following samples:

Method: SW846-8015B

D30796-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	499	75	58-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	85%	43-136%

8.2.1

8

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D30796

Account: KRWCCOL KRW Consulting, Inc.

Project: XOM FRU 297-28C

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP5105-MS	FD12672.D	1	01/05/12	TR	01/05/12	OP5105	GFD657
OP5105-MSD	FD12673.D	1	01/05/12	TR	01/05/12	OP5105	GFD657
D30779-3	FD12679.D	10	01/05/12	TR	01/05/12	OP5105	GFD657

The QC reported here applies to the following samples:

Method: SW846-8015B

D30796-1

CAS No.	Compound	D30779-3 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	5840		691	4940	715* a	4610	666* a	7	20-183/43

CAS No.	Surrogate Recoveries	MS	MSD	D30779-3	Limits
84-15-1	o-Terphenyl	101%	99%	116%	43-136%

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

Metals Analysis

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: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 01/06/12

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	0.040	<1.0
Beryllium	1.0	.044	.1		
Boron	5.0	.48	.48		
Cadmium	1.0	.027	.27	0.0	<1.0
Calcium	40	.96	1.1		
Chromium	1.0	.018	.031	-0.050	<1.0
Cobalt	0.50	.035	.035		
Copper	1.0	.085	.16	-0.030	<1.0
Iron	7.0	.34	2		
Lead	5.0	.16	.21	-0.040	<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	-0.020	<3.0
Phosphorus	10	1.1	1.2		
Potassium	200	5.5	9.2		
Selenium	5.0	.38	.5	0.27	<5.0
Silicon	5.0	.38	.51		
Silver	3.0	.018	.051	-0.11	<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	-0.060	<3.0

Associated samples MP6610: D30796-1

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 01/06/12

Metal	D30796-1 Original MS		Spikelot MPICPALL % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	691	1030	220	154.4N(a) 75-125
Beryllium				
Boron				
Cadmium	0.045	46.6	54.9	84.8 75-125
Calcium				
Chromium	37.7	82.3	54.9	81.3 75-125
Cobalt				
Copper	5.6	54.5	54.9	89.1 75-125
Iron				
Lead	9.9	102	110	83.9 75-125
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	12.6	55.2	54.9	77.6 75-125
Phosphorus				
Potassium				
Selenium	1.0	89.7	110	80.8 75-125
Silicon				
Silver	0.034	19.5	22	88.7 75-125
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	37.0	80.2	54.9	78.7 75-125

Associated samples MP6610: D30796-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
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 recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 01/06/12

	D30796-1		Spikelot		MSD	QC
Metal	Original	MSD	MPICPAL	% Rec	RPD	Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	691	937	224	109.9	9.5	20
Beryllium						
Boron						
Cadmium	0.045	48.4	56	86.4	3.8	20
Calcium						
Chromium	37.7	86.5	56	87.2	5.0	20
Cobalt						
Copper	5.6	55.7	56	89.5	2.2	20
Iron						
Lead	9.9	106	112	85.9	3.8	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	12.6	58.2	56	81.5	5.3	20
Phosphorus						
Potassium						
Selenium	1.0	92.9	112	82.1	3.5	20
Silicon						
Silver	0.034	20.1	22.4	89.6	3.0	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	37.0	82.8	56	81.8	3.2	20

Associated samples MP6610: D30796-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

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

9.1.2

9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D30796
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-28C

QC Batch ID: MP6610
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 01/06/12

Metal	BSP Result	Spikelot MPICPAL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	190	200	95.0	80-120
Beryllium				
Boron				
Cadmium	48.3	50	96.6	80-120
Calcium				
Chromium	50.2	50	100.4	80-120
Cobalt				
Copper	49.4	50	98.8	80-120
Iron				
Lead	99.7	100	99.7	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	48.3	50	96.6	80-120
Phosphorus				
Potassium				
Selenium	94.3	100	94.3	80-120
Silicon				
Silver	20.0	20	100.0	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	48.0	50	96.0	80-120

Associated samples MP6610: D30796-1

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

9.1.3

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 01/06/12

Metal	D30796-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	6170	7680	24.4*(a)	0-10
Beryllium				
Boron				
Cadmium	0.400	0.00	100.0(b)	0-10
Calcium				
Chromium	337	359	6.5	0-10
Cobalt				
Copper	49.6	43.5	12.3*(c)	0-10
Iron				
Lead	88.1	69.0	21.7*(c)	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	112	128	13.9*(c)	0-10
Phosphorus				
Potassium				
Selenium	9.30	0.00	100.0(b)	0-10
Silicon				
Silver	0.300	0.00	100.0(b)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	330	382	15.5*(c)	0-10

Associated samples MP6610: D30796-1

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6610
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference and/or sample nonhomogeneity.
(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
(c) Serial dilution indicates possible matrix interference.

9.1.4

9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6611
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 01/06/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.3		
Antimony	0.20	.001	.012		
Arsenic	0.40	.049	.1	0.15	<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	.19		
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 MP6611: D30796-1

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: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6611
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 01/06/12

Metal	D30796-1 Original MS		Spikelot MPICPALL	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	3.3	116	110	102.7	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 MP6611: D30796-1

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: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6611
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 01/06/12

Metal	D30796-1 Original	MSD	Spikelot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	3.3	119	112	103.4	2.6	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 MP6611: D30796-1

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: D30796
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-28C

QC Batch ID: MP6611
 Matrix Type: SOLID

Methods: SW846 6020A
 Units: mg/kg

Prep Date: 01/06/12

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	109	100	109.0	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 MP6611: D30796-1

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6611
Matrix Type: SOLID

Methods: SW846 6020A
Units: ug/l

Prep Date: 01/06/12

Metal	D30796-1	QC
Original	SDL 5:25 %DIF	Limits

Aluminum				
Antimony				
Arsenic	29.6	33.0	11.3*(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 MP6611: D30796-1

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
Matrix Type: AQUEOUS

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

Prep Date: 01/06/12

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	-6.5	<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	10.0	<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	-15	<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 MP6612: D30796-1A

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
Matrix Type: AQUEOUS

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

Prep Date: 01/06/12

Metal	D30797-1A Original MS		Spikelot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	277000	414000	125000	109.6	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	170	125000	125000	99.9	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	475000	604000	125000	103.2	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP6612: D30796-1A

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
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: D30796
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-28C

QC Batch ID: MP6612
 Matrix Type: AQUEOUS

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

Prep Date: 01/06/12

Metal	D30797-1A Original MSD		Spikelot MPICPAL % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	277000	423000	125000	116.8	2.2	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	170	126000	125000	100.7	0.8	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	475000	622000	125000	117.6	2.9	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP6612: D30796-1A

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
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: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
Matrix Type: AQUEOUS

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

Prep Date: 01/06/12

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	134000	125000	107.2	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	127000	125000	101.6	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	123000	125000	98.4	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP6612: D30796-1A

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6612
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: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

QC Batch ID: MP6625
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 01/10/12

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.10	.0011	.013	0.0033	<0.10

Associated samples MP6625: D30796-1

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: D30796
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-28C

QC Batch ID: MP6625
 Matrix Type: SOLID

Methods: SW846 7471B
 Units: mg/kg

Prep Date: 01/10/12

Metal	D30793-1		Spikelot		QC	
	Original	MS	HGWSR1	% Rec	Limits	
Mercury	0.0070	0.50	0.492	100.1	75-125	

Associated samples MP6625: D30796-1

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: D30796
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-28C

QC Batch ID: MP6625
 Matrix Type: SOLID

Methods: SW846 7471B
 Units: mg/kg

Prep Date: 01/10/12

Metal	D30793-1 Original MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.0070	0.48	0.473	100.0	4.1

Associated samples MP6625: D30796-1

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: D30796
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: XOM FRU 297-28C

QC Batch ID: MP6625
 Matrix Type: SOLID

Methods: SW846 7471B
 Units: mg/kg

Prep Date: 01/10/12

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.44	0.4	110.0	80-120

Associated samples MP6625: D30796-1

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: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP6259/GN13165	1.0	<1.0	umhos/cm	10008	10100	100.6	90-110%
pH	GN13151			su	8.00	7.98	99.8	99.3-100.7%

Associated Samples:
Batch GN13151: D30796-1
Batch GP6259: D30796-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D30796
Account: KRWCCOL - KRW Consulting, Inc.
Project: XOM FRU 297-28C

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Redox Potential Vs H2	GN13150	D30796-1	mv	394	396	0.5	0-20%

Associated Samples:
Batch GN13150: D30796-1
(*) Outside of QC limits

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D30796

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 1/6/2012

Delivery Method:

Client Service Action Required at Login: No

Project:

No. Coolers: 1

Airbill #'s:

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"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" 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 recvd 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

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

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: D30796
Account: ALMS - Accutest Mountain States
Project: KRWCCOL: XOM FRU 297-28C

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP14024/GN37508	0.40	0.0	mg/kg	40	43.4	108.5	80-120%
Chromium, Hexavalent	GP14024/GN37508			mg/kg	650	771	118.6	80-120%

Associated Samples:
Batch GP14024: D30796-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D30796
Account: ALMS - Accutest Mountain States
Project: KRWCCOL: XOM FRU 297-28C

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP14024/GN37508	D30796-1	mg/kg	0.57	0.59	3.4	0-20%

Associated Samples:
Batch GP14024: D30796-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D30796
Account: ALMS - Accutest Mountain States
Project: KRWCCOL: XOM FRU 297-28C

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP14024/GN37508	D30796-1	mg/kg	0.57	44.9	49.6	109.1	75-125%
Chromium, Hexavalent	GP14024/GN37508	D30796-1	mg/kg	0.57	1430	1520	106.5	75-125%

Associated Samples:
Batch GP14024: D30796-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits