

Technical Report for

KRW Consulting, Inc.

FRU 297-8B

1106-06

Accutest Job Number: D25856

Sampling Date: 07/25/11

Report to:

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Total number of pages in report: 56



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.



John Hamilton
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: D25856

FRU 297-8B

Project No: 1106-06

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D25856-1	07/25/11	11:15 BB	07/26/11	SO	Soil	CUTTINGS PIT #1
D25856-1A	07/25/11	11:15 BB	07/26/11	SO	Soil	CUTTINGS PIT #1
D25856-2	07/25/11	11:40 BB	07/26/11	SO	Soil	CUTTINGS PIT #2
D25856-2A	07/25/11	11:40 BB	07/26/11	SO	Soil	CUTTINGS PIT #2
D25856-3	07/25/11	12:00 BB	07/26/11	SO	Soil	RESERVE PIT
D25856-3A	07/25/11	12:00 BB	07/26/11	SO	Soil	RESERVE PIT

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: KRW Consulting, Inc.

Job No D25856

Site: FRU 297-8B

Report Date 8/2/2011 10:53:10 AM

On 07/26/2011, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.4 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D25856 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: V3V761
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D25830-2MS, D25830-2MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB690
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D25807-2MS, D25807-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP4147
------------------	-------------------------

- All samples were extracted 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) D25592-1RMS, D25592-1RMSD were used as the QC samples indicated.

Metals By Method SW846 6010B

Matrix AQ	Batch ID: MP5330
------------------	-------------------------

- All samples were digested 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) D25856-3AMS, D25856-3AMS were used as the QC samples for the metals analysis.

Metals By Method SW846 6020

Matrix SO

Batch ID: MP5329

- All samples were digested 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) D25788-1MS, D25788-1MSD, D25788-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP5329-SD1. Serial dilution indicates possible matrix interference.

Wet Chemistry By Method SM19 2540B M

Matrix SO

Batch ID: GN10723

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

Wet Chemistry By Method USDA HANDBOOK 60

Matrix SO

Batch ID: MP5330

- All samples 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 Results

Report of Analysis

Report of Analysis

3.1
3

Client Sample ID: CUTTINGS PIT #1	
Lab Sample ID: D25856-1	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846 8260B	Percent Solids: 79.2
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V13380.D	1	07/26/11	BR	n/a	n/a	V3V761
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	174	76	33	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	84%		61-130%
460-00-4	4-Bromofluorobenzene	82%		53-131%
17060-07-0	1,2-Dichloroethane-D4	77%		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

3.1
3

Client Sample ID: CUTTINGS PIT #1	
Lab Sample ID: D25856-1	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846 8015B	Percent Solids: 79.2
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB12019.D	1	07/26/11	SK	n/a	n/a	GGB690
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)	131	15	7.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	82%		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

3.1
3

Client Sample ID: CUTTINGS PIT #1	
Lab Sample ID: D25856-1	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846-8015B SW846 3546	Percent Solids: 79.2
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD08174.D	2	07/29/11	CS	07/27/11	OP4147	GFD362
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)	1040	34	22	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		61-142%		

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: CUTTINGS PIT #1	Date Sampled: 07/25/11
Lab Sample ID: D25856-1	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.2
Project: FRU 297-8B	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	18.5	0.49	mg/kg	5	07/27/11	07/28/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1707

(2) Prep QC Batch: MP5329

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #1	Date Sampled: 07/25/11
Lab Sample ID: D25856-1	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.2
Project: FRU 297-8B	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	79.2		%	1	07/27/11	SWT	SM19 2540B M
Specific Conductivity	14500	1.0	umhos/cm	1	07/27/11	CJ	DEPT.OF AG, BOOK N9
pH	11.93		su	1	07/26/11 15:25	JD	SW846 9045C

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #1	Date Sampled: 07/25/11
Lab Sample ID: D25856-1A	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.2
Project: FRU 297-8B	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	5.66	2.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	< 1.0	1.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	2890	2.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA1708

(2) Prep QC Batch: MP5330

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #1	Date Sampled: 07/25/11
Lab Sample ID: D25856-1A	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.2
Project: FRU 297-8B	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	327		ratio	1	07/27/11 17:23	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #2	
Lab Sample ID: D25856-2	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846 8015B	Percent Solids: 79.6
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB12020.D	1	07/26/11	SK	n/a	n/a	GGB690
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	200	15	7.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	87%		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: CUTTINGS PIT #2	
Lab Sample ID: D25856-2	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846-8015B SW846 3546	Percent Solids: 79.6
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD08175.D	2	07/29/11	CS	07/27/11	OP4147	GFD362
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)	1530	34	22	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	83%		61-142%		

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: CUTTINGS PIT #2	Date Sampled: 07/25/11
Lab Sample ID: D25856-2	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.6
Project: FRU 297-8B	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	16.3	0.50	mg/kg	5	07/27/11	07/28/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1707

(2) Prep QC Batch: MP5329

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #2	Date Sampled: 07/25/11
Lab Sample ID: D25856-2	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.6
Project: FRU 297-8B	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	79.6		%	1	07/27/11	SWT	SM19 2540B M
Specific Conductivity	8340	1.0	umhos/cm	1	07/27/11	CJ	DEPT.OF AG, BOOK N9
pH	11.09		su	1	07/26/11 15:25	JD	SW846 9045C

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #2	Date Sampled: 07/25/11
Lab Sample ID: D25856-2A	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.6
Project: FRU 297-8B	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	9.07	2.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	1.22	1.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	2080	2.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA1708

(2) Prep QC Batch: MP5330

RL = Reporting Limit

Report of Analysis

Client Sample ID: CUTTINGS PIT #2	Date Sampled: 07/25/11
Lab Sample ID: D25856-2A	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 79.6
Project: FRU 297-8B	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	172		ratio	1	07/27/11 17:33	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

3.5
3

Client Sample ID: RESERVE PIT	
Lab Sample ID: D25856-3	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846 8015B	Percent Solids: 58.6
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB12021.D	1	07/26/11	SK	n/a	n/a	GGB690
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	24	12	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	75%		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

3.5
3

Client Sample ID: RESERVE PIT	
Lab Sample ID: D25856-3	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
Method: SW846-8015B SW846 3546	Percent Solids: 58.6
Project: FRU 297-8B	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD08176.D	2	07/29/11	CS	07/27/11	OP4147	GFD362
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	224	45	29	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	67%		61-142%		

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: RESERVE PIT	Date Sampled: 07/25/11
Lab Sample ID: D25856-3	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 58.6
Project: FRU 297-8B	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4.1	0.68	mg/kg	5	07/27/11	07/28/11 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA1707

(2) Prep QC Batch: MP5329

RL = Reporting Limit

Report of Analysis

Client Sample ID: RESERVE PIT	Date Sampled: 07/25/11
Lab Sample ID: D25856-3	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 58.6
Project: FRU 297-8B	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	58.6		%	1	07/27/11	SWT	SM19 2540B M
Specific Conductivity	2930	1.0	umhos/cm	1	07/27/11	CJ	DEPT.OF AG, BOOK N9
pH	11.82		su	1	07/26/11 15:25	JD	SW846 9045C

RL = Reporting Limit

Report of Analysis

Client Sample ID: RESERVE PIT	Date Sampled: 07/25/11
Lab Sample ID: D25856-3A	Date Received: 07/26/11
Matrix: SO - Soil	Percent Solids: 58.6
Project: FRU 297-8B	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	7.57	2.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	< 1.0	1.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	328	2.0	mg/l	1	07/27/11	07/27/11 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA1708

(2) Prep QC Batch: MP5330

RL = Reporting Limit

Report of Analysis

Client Sample ID: RESERVE PIT	
Lab Sample ID: D25856-3A	Date Sampled: 07/25/11
Matrix: SO - Soil	Date Received: 07/26/11
	Percent Solids: 58.6
Project: FRU 297-8B	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	32.0		ratio	1	07/27/11 16:52	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

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: D25856

Client: KRW

Immediate Client Services Action Required: No

Date / Time Received: 7/26/2011 1:15:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XOM FRU 297-8B

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
4

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

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V761-MB	3V13366.D	1	07/26/11	BR	n/a	n/a	V3V761

The QC reported here applies to the following samples:

Method: SW846 8260B

D25856-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.44	ug/kg	

CAS No.	Surrogate Recoveries	Limits	
2037-26-5	Toluene-D8	84%	61-130%
460-00-4	4-Bromofluorobenzene	73%	53-131%
17060-07-0	1,2-Dichloroethane-D4	80%	62-130%

Blank Spike Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V761-BS	3V13367.D	1	07/26/11	BR	n/a	n/a	V3V761

The QC reported here applies to the following samples:

Method: SW846 8260B

D25856-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	44.1	88	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	83%	61-130%
460-00-4	4-Bromofluorobenzene	75%	53-131%
17060-07-0	1,2-Dichloroethane-D4	76%	62-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D25830-2MS	3V13370.D	1	07/26/11	BR	n/a	n/a	V3V761
D25830-2MSD	3V13371.D	1	07/26/11	BR	n/a	n/a	V3V761
D25830-2	3V13369.D	1	07/26/11	BR	n/a	n/a	V3V761

The QC reported here applies to the following samples:

Method: SW846 8260B

D25856-1

CAS No.	Compound	D25830-2 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	3270	3280	100	3190	97	3	70-134/30

CAS No.	Surrogate Recoveries	MS	MSD	D25830-2	Limits
2037-26-5	Toluene-D8	83%	83%	81%	61-130%
460-00-4	4-Bromofluorobenzene	80%	80%	76%	53-131%
17060-07-0	1,2-Dichloroethane-D4	86%	80%	80%	62-130%

5.3.1
5

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB690-MB	GB12000.D	1	07/26/11	SK	n/a	n/a	GGB690

The QC reported here applies to the following samples:

Method: SW846 8015B

D25856-1, D25856-2, D25856-3

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	82% 60-140%

Blank Spike Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB690-BS	GB12001.D	1	07/26/11	SK	n/a	n/a	GGB690

The QC reported here applies to the following samples:

Method: SW846 8015B

D25856-1, D25856-2, D25856-3

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	118	107	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	96%	60-140%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D25807-2MS	GB12003.D	1	07/26/11	SK	n/a	n/a	GGB690
D25807-2MSD	GB12004.D	1	07/26/11	SK	n/a	n/a	GGB690
D25807-2	GB12002.D	1	07/26/11	SK	n/a	n/a	GGB690

The QC reported here applies to the following samples:

Method: SW846 8015B

D25856-1, D25856-2, D25856-3

CAS No.	Compound	D25807-2 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	144	153	106	152	106	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D25807-2	Limits
120-82-1	1,2,4-Trichlorobenzene	95%	94%	78%	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

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4147-MB	FD08159.D	1	07/28/11	CS	07/27/11	OP4147	GFD362

The QC reported here applies to the following samples:

Method: SW846-8015B

D25856-1, D25856-2, D25856-3

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	94% 61-142%

7.1.1
7

Blank Spike Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4147-BS	FD08160.D	1	07/28/11	CS	07/27/11	OP4147	GFD362

The QC reported here applies to the following samples:

Method: SW846-8015B

D25856-1, D25856-2, D25856-3

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	569	85	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	95%	61-142%

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D25856
Account: KRWCCOL KRW Consulting, Inc.
Project: FRU 297-8B

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4147-MS	FD08161.D	1	07/28/11	CS	07/27/11	OP4147	GFD362
OP4147-MSD	FD08162.D	1	07/28/11	CS	07/27/11	OP4147	GFD362
D25592-1R	FD08163.D	1	07/28/11	CS	07/27/11	OP4147	GFD362

The QC reported here applies to the following samples:

Method: SW846-8015B

D25856-1, D25856-2, D25856-3

CAS No.	Compound	D25592-1R mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	1370	733	1700	45	1830	63	7	24-157/35	

CAS No.	Surrogate Recoveries	MS	MSD	D25592-1R	Limits
84-15-1	o-Terphenyl	80%	83%	84%	61-142%

7.3.1

7

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: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

QC Batch ID: MP5329
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 07/27/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.2		
Antimony	0.20	.001	.0095		
Arsenic	0.40	.049	.22	0.032	<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 MP5329: D25856-1, D25856-2, D25856-3

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

8.1.1
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5329
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/27/11

Metal	D25788-1 Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	3.9	99.3	111	86.1	60-119
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 MP5329: D25856-1, D25856-2, D25856-3

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

8.12
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5329
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/27/11

Metal	D25788-1 Original MSD		SpikeLot MPICPAL % Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	3.9	104	116	86.2	4.6	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 MP5329: D25856-1, D25856-2, D25856-3

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

8.12
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5329
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/27/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	98.7	100	98.7	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 MP5329: D25856-1, D25856-2, D25856-3

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

8.1.3
 8

SERIAL DILUTION RESULTS SUMMARY

Login Number: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5329
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 07/27/11

Metal	D25788-1 Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	34.5	43.8	27.0*(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 MP5329: D25856-1, D25856-2, D25856-3

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

8.1.4
8

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

QC Batch ID: MP5330
Matrix Type: AQUEOUS

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

Prep Date: 07/27/11

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	0.50	<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	-8.5	<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	-720	<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 MP5330: D25856-1A, D25856-2A, D25856-3A

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

QC Batch ID: MP5330
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

8.2.1

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5330
 Matrix Type: AQUEOUS

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

Prep Date: 07/27/11

Metal	D25856-3A Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	7570	148000	125000	112.3	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	215	131000	125000	104.6	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	328000	467000	125000	111.2	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP5330: D25856-1A, D25856-2A, D25856-3A

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

8.2.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

QC Batch ID: MP5330
Matrix Type: AQUEOUS

Methods: SW846 6010B, 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: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5330
 Matrix Type: AQUEOUS

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

Prep Date: 07/27/11

Metal	D25856-3A Original MSD		SpikeLot MPICPAL % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	7570	147000	125000	111.5	0.7	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	215	130000	125000	103.8	0.8	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	328000	475000	125000	117.6	1.7	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP5330: D25856-1A, D25856-2A, D25856-3A

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

8.2.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

QC Batch ID: MP5330
Matrix Type: AQUEOUS

Methods: SW846 6010B, 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: D25856
 Account: KRWCCOL - KRW Consulting, Inc.
 Project: FRU 297-8B

QC Batch ID: MP5330
 Matrix Type: AQUEOUS

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

Prep Date: 07/27/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	140000	125000	112.0	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	131000	125000	104.8	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	135000	125000	108.0	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP5330: D25856-1A, D25856-2A, D25856-3A

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

8.2.3
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

QC Batch ID: MP5330
Matrix Type: AQUEOUS

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

Prep Date:

Metal

(anr) Analyte not requested

8.2.3

8

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: D25856
Account: KRWCCOL - KRW Consulting, Inc.
Project: FRU 297-8B

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP5031/GN10742			umhos/cm	9986	10100	101.0	90-110%
pH	GN10721			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:

Batch GN10721: D25856-1, D25856-2, D25856-3

Batch GP5031: D25856-1, D25856-2, D25856-3

(*) Outside of QC limits