

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

June 29, 2015

Shad Martin
Kinetic Energy
PO Box 1625
Loveland, CO 80539
RE: Frontier 8

Enclosed are the results of analyses for samples received by Summit Scientific on 06/18/15 12:43. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury
President



Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Cuttings 8@12794'	1506163-01	Soil	06/18/15 10:00	06/18/15 12:43
Drill Mud 8@12794'	1506163-02	Water	06/18/15 10:00	06/18/15 12:43

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

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S₂

1506163

741 Corporate Circle, Suite J ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933

Page 1 of 1

Client: Kinetic Energy Services

Project Manager: Chad

Address:

E-Mail:

City/State/Zip:

Phone:

Fax:

Project Name:

Frontier 8

Sampler Name:

Project Number:

Arellano Q 10-9 HN

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	As	Br	Ca	Fe	Mg	Mn		K
1	Cuttings BQ	6-18	1500	1																
2	drill mud BQ	6-18	1545	1																
3	127944																			
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Relinquished by:	Date/Time: 6/18/15 12:43	Received by:	Date/Time: 6-18-15 1243	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours <input type="checkbox"/> 24 hours <input type="checkbox"/> Standard <input type="checkbox"/> 48 hours <input type="checkbox"/> Sample Integrity: Temperature Upon Receipt: 36 Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	Notes: Nud by 23rd EOB cred: +
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Project Manager: Shad Martin

Reported:
06/29/15 17:02

Sample Receipt Checklist

S2 Work Order: 1506163

Client: Kinetic Energy Client Project ID: Frontier 8

Shipped Via: _____ Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): ☐ Air ☒ Soil/Solid ☐ Water ☐ Other: _____
(Describe)

Cooler ID					
Temp (°C)	<u>36</u>				

Thermometer ID: _____

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, etc.				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

Melissa Sherman
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

6-29-15
Date/Time

[Signature]



Kinetic Energy
PO Box 1625
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Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Cuttings 8@12794'
1506163-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	84	50	mg/kg	1	1506243	06/18/15	06/19/15	8015M	

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		107 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.55	0.20	mg/kg	100	1506246	06/18/15	06/19/15	EPA 8260B	
Toluene	3.0	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	6.3	0.50	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	260	50	"	"	"	"	"	"	

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.9 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	11.6	0.182	mg/kg dry	1	1506248	06/19/15	06/19/15	EPA 6020A	
Barium	1100	0.182	"	"	"	"	"	"	

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1506163-01 (Soil)

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Total Metals by EPA Method 6020 - Dry Weight Basis

Boron	14.7	1.82 mg/kg dry	1	1506248	06/19/15	06/19/15	EPA 6020A
Cadmium	0.187	0.182 "	"	"	"	"	"
Chromium	25.6	0.912 "	"	"	"	"	"
Copper	32.0	0.912 "	"	"	"	"	"
Lead	24.8	0.182 "	"	"	"	"	"
Nickel	32.5	0.182 "	"	"	"	"	"
Selenium	1.67	0.0912 "	"	"	"	"	"
Silver	0.245	0.182 "	"	"	"	"	"
Zinc	120	18.2 "	"	"	"	"	"

Total Mercury by EPA Method 7471

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0516	mg/kg dry	1	1506279	06/22/15	06/23/15	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	2.17	mg/kg dry	1	1506273	06/22/15	06/23/15	EPA 7196	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trivalent Chromium	25.6	3.09	"	"	[CALC]	"	"	EPA 7196/3060A	

Anions by EPA Method 300.0

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	0.727	0.100	mg/kg	1	1506343	06/26/15	06/26/15	EPA 300.0	

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Anions by EPA Method 300.0

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloride	544	0.100	mg/kg	1	1506343	06/26/15	06/26/15	EPA 300.0	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Fluoride	28.9	0.100	"	"	"	"	"	"	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sulfate	372	0.100	"	"	"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	46.0		%	1	1506252	06/19/15	06/22/15	% calculation	

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Reported:
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Drill Mud 8@12794'
1506163-02 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	213	10.0	mg/L	1	1506288	06/22/15	06/23/15	8015M	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		100 %	47.2-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	120	10	ug/l	10	1506245	06/19/15	06/19/15	EPA 8260B	
Toluene	870	10	"	"	"	"	"	"	
Ethylbenzene	170	10	"	"	"	"	"	"	
Xylenes (total)	2400	10	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	56000	5000	"	"	"	"	"	"	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		91.1 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		94.4 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		112 %	45-146		"	"	"	"	

Total Metals by EPA Method 200.8

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	6250	0.0500	mg/L	1	1506271	06/22/15	06/22/15	EPA 200.8	

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06/29/15 17:02

Drill Mud 8@12794'
1506163-02 (Water)

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Total Metals by EPA Method 200.8

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Iron	627	0.0500	mg/L	1	1506271	06/22/15	06/22/15	EPA 200.8	

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Potassium	48.3	0.0500	"	"	"	"	"	"	

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Magnesium	59.2	0.0500	"	"	"	"	"	"	

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manganese	14.4	0.00100	"	"	"	"	"	"	

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium	488	0.0500	"	"	"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: 06/18/15 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	6.30	0.500	mg/L	1	1506345	06/26/15	06/29/15	EPA 300.0	

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Reported:
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Drill Mud 8@12794'
1506163-02 (Water)

Summit Scientific

Anions by EPA Method 300.0

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloride	524	50.0	mg/L	1	1506345	06/26/15	06/29/15	EPA 300.0	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Fluoride	9.15	4.50	"	"	"	"	"	"	

Date Sampled: **06/18/15 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sulfate	323	50.0	"	"	"	"	"	"	

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Reported:
06/29/15 17:02

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506243 - EPA 3550A

Blank (1506243-BLK1)

Prepared & Analyzed: 06/18/15

C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	14.7		"	12.2		121	30-150			

LCS (1506243-BS1)

Prepared & Analyzed: 06/18/15

C10-C28 (DRO)	575	50	mg/kg	501		115	73-134			
Surrogate: o-Terphenyl	14.2		"	12.2		117	30-150			

Matrix Spike (1506243-MS1)

Source: 1506158-04

Prepared & Analyzed: 06/18/15

C10-C28 (DRO)	556	50	mg/kg	460	9.89	119	50-148			
Surrogate: o-Terphenyl	12.5		"	11.2		111	30-150			

Matrix Spike Dup (1506243-MSD1)

Source: 1506158-04

Prepared & Analyzed: 06/18/15

C10-C28 (DRO)	724	50	mg/kg	467	9.89	153	50-148	26.2	13	QM-07
Surrogate: o-Terphenyl	13.3		"	11.4		117	30-150			

Batch 1506288 - EPA 3520B

Blank (1506288-BLK1)

Prepared: 06/22/15 Analyzed: 06/23/15

C10-C28 (DRO)	ND	5.00	mg/L							
Surrogate: o-Terphenyl	12.2		"	12.2		100	47.2-150			

LCS (1506288-BS1)

Prepared: 06/22/15 Analyzed: 06/23/15

C10-C28 (DRO)	509	5.00	mg/L	501		102	80-149			
Surrogate: o-Terphenyl	12.4		"	12.2		102	47.2-150			

LCS Dup (1506288-BSD1)

Prepared: 06/22/15 Analyzed: 06/23/15

C10-C28 (DRO)	527	5.00	mg/L	501		105	80-149	3.37	14	
Surrogate: o-Terphenyl	12.8		"	12.2		105	47.2-150			

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Project Manager: Shad Martin

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06/29/15 17:02

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506245 - EPA 5030 Water MS

Blank (1506245-BLK1)

Prepared & Analyzed: 06/19/15

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Gasoline Range Hydrocarbons	ND	500	"							
Surrogate: 1,2-Dichloroethane-d4	13.8		"	13.2		104	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		99.0	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.4	45-146			

LCS (1506245-BS1)

Prepared & Analyzed: 06/19/15

Benzene	43.9	1.0	ug/l	50.0		87.9	51-132			
Toluene	43.8	1.0	"	50.0		87.6	51-138			
Ethylbenzene	44.2	1.0	"	50.0		88.4	58-146			
m,p-Xylene	86.7	2.0	"	100		86.7	57-144			
o-Xylene	44.1	1.0	"	50.0		88.2	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		102	37-154			
Surrogate: Toluene-d8	13.5		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.4	45-146			

Matrix Spike (1506245-MS1)

Source: 1506151-01

Prepared & Analyzed: 06/19/15

Benzene	45.8	1.0	ug/l	50.0	ND	91.6	34-141			
Toluene	45.6	1.0	"	50.0	ND	91.2	27-151			
Ethylbenzene	45.7	1.0	"	50.0	ND	91.4	29-160			
m,p-Xylene	91.1	2.0	"	100	ND	91.1	20-166			
o-Xylene	46.0	1.0	"	50.0	ND	92.0	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.7		"	13.2		104	37-154			
Surrogate: Toluene-d8	13.6		"	13.3		102	45-149			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.3	45-146			

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506245 - EPA 5030 Water MS

Matrix Spike Dup (1506245-MSD1)				Source: 1506151-01		Prepared & Analyzed: 06/19/15				
Benzene	42.7	1.0	ug/l	50.0	ND	85.3	34-141	7.14	32	
Toluene	42.6	1.0	"	50.0	ND	85.2	27-151	6.89	25	
Ethylbenzene	43.5	1.0	"	50.0	ND	86.9	29-160	5.02	50	
m,p-Xylene	85.5	2.0	"	100	ND	85.5	20-166	6.31	36	
o-Xylene	43.1	1.0	"	50.0	ND	86.3	33-159	6.46	26	
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	37-154			
Surrogate: Toluene-d8	13.3		"	13.3		99.9	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.9	45-146			

Batch 1506246 - EPA 5030 Soil MS

Blank (1506246-BLK1)				Prepared & Analyzed: 06/18/15						
Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0387		"	0.0396		97.7	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0393		"	0.0400		98.2	21-167			
LCS (1506246-BS1)				Prepared & Analyzed: 06/18/15						
Benzene	0.113	0.0020	mg/kg	0.100		113	58-130			
Toluene	0.102	0.0050	"	0.100		102	61-134			
Ethylbenzene	0.107	0.0050	"	0.0992		108	74-139			
m,p-Xylene	0.215	0.010	"	0.200		108	73-137			
o-Xylene	0.109	0.0050	"	0.0984		111	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0390		"	0.0396		98.6	23-173			
Surrogate: Toluene-d8	0.0384		"	0.0400		95.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0390		"	0.0400		97.4	21-167			

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Reported:
06/29/15 17:02

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506246 - EPA 5030 Soil MS

Matrix Spike (1506246-MS1)		Source: 1506159-01			Prepared & Analyzed: 06/18/15					
Benzene	0.112	0.0020	mg/kg	0.0975	ND	115	30-131			
Toluene	0.0989	0.0050	"	0.0975	ND	101	30-134			
Ethylbenzene	0.106	0.0050	"	0.0967	ND	110	22-153			
m,p-Xylene	0.213	0.010	"	0.195	ND	109	10-159			
o-Xylene	0.109	0.0050	"	0.0959	ND	114	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0389		"	0.0386		101	23-173			
Surrogate: Toluene-d8	0.0379		"	0.0390		97.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0390		99.2	21-167			

Matrix Spike Dup (1506246-MSD1)		Source: 1506159-01			Prepared & Analyzed: 06/18/15					
Benzene	0.106	0.0020	mg/kg	0.0936	ND	113	30-131	5.98	34	
Toluene	0.0951	0.0050	"	0.0936	ND	102	30-134	3.98	30	
Ethylbenzene	0.0991	0.0050	"	0.0929	ND	107	22-153	6.78	24	
m,p-Xylene	0.199	0.010	"	0.187	ND	106	10-159	6.69	68	
o-Xylene	0.101	0.0050	"	0.0921	ND	110	31-151	8.04	38	
Surrogate: 1,2-Dichloroethane-d4	0.0379		"	0.0371		102	23-173			
Surrogate: Toluene-d8	0.0362		"	0.0375		96.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0360		"	0.0375		96.2	21-167			

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506248 - EPA 3050B

Blank (1506248-BLK1)

Prepared & Analyzed: 06/19/15

Arsenic	ND	0.100	mg/kg wet
Barium	ND	0.100	"
Boron	ND	1.00	"
Cadmium	ND	0.100	"
Chromium	ND	0.500	"
Copper	ND	0.500	"
Lead	ND	0.100	"
Nickel	ND	0.100	"
Selenium	ND	0.0500	"
Silver	ND	0.100	"
Zinc	ND	10.0	"

LCS (1506248-BS1)

Prepared & Analyzed: 06/19/15

Arsenic	109	0.250	mg/kg wet	99.6	110	78.4-140
Barium	302	0.250	"	310	97.5	83.2-117
Boron	172	2.50	"	144	119	73.6-126
Cadmium	178	0.250	"	182	97.9	81.9-118
Chromium	135	1.25	"	136	99.1	80.1-121
Copper	99.8	1.25	"	102	97.8	81.1-119
Lead	112	0.250	"	115	97.6	81.8-119
Nickel	156	0.250	"	153	102	82.4-118
Selenium	164	0.125	"	150	110	77.3-123
Silver	37.0	0.250	"	40.4	91.5	75-125
Zinc	156	25.0	"	133	117	80.7-132

Duplicate (1506248-DUP1)

Source: 1506171-01

Prepared & Analyzed: 06/19/15

Arsenic	9.66	0.122	mg/kg dry	6.89	33.5	20	QR-03
Barium	769	0.122	"	2960	117	20	QR-03
Boron	8.56	1.22	"	8.89	3.78	20	
Cadmium	1.60	0.122	"	4.75	99.1	20	QR-03
Chromium	17.1	0.609	"	6.47	89.9	20	QR-03
Copper	23.7	0.609	"	18.8	23.3	20	QR-03
Lead	11.4	0.122	"	3.27	111	20	QR-03
Nickel	24.5	0.122	"	24.5	0.126	20	
Selenium	2.98	0.0609	"	6.52	74.5	20	QR-03
Silver	0.140	0.122	"	0.151	7.85	20	
Zinc	81.2	12.2	"	81.1	0.102	20	

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506248 - EPA 3050B

Matrix Spike (1506248-MS1)			Source: 1506171-01		Prepared & Analyzed: 06/19/15					
Arsenic	73.3	0.131	mg/kg dry	52.3	6.89	127	75-125			QM-07
Barium	1760	0.131	"	52.3	2960	NR	75-125			QM-07
Boron	12.1	1.31	"	52.3	8.89	6.13	75-125			QM-07
Cadmium	6.05	0.131	"	2.61	4.75	49.9	75-125			QM-07
Chromium	77.1	0.654	"	52.3	6.47	135	75-125			QM-07
Copper	88.5	0.654	"	52.3	18.8	133	75-125			QM-07
Lead	36.3	0.131	"	26.1	3.27	127	75-125			QM-07
Nickel	89.6	0.131	"	52.3	24.5	124	75-125			
Selenium	12.0	0.0654	"	5.23	6.52	104	75-125			
Silver	3.20	0.131	"	2.61	0.151	117	75-125			
Zinc	160	13.1	"	52.3	81.1	151	75-125			QM-07

Matrix Spike Dup (1506248-MSD1)			Source: 1506171-01		Prepared & Analyzed: 06/19/15					
Arsenic	71.5	0.144	mg/kg dry	52.7	6.89	123	75-125	2.46	25	
Barium	1880	0.144	"	52.7	2960	NR	75-125	6.21	25	QM-07
Boron	12.3	1.44	"	52.7	8.89	6.41	75-125	1.39	25	QM-07
Cadmium	5.34	0.144	"	2.63	4.75	22.7	75-125	12.4	25	QM-07
Chromium	77.7	0.722	"	52.7	6.47	135	75-125	0.825	25	QM-07
Copper	88.1	0.722	"	52.7	18.8	132	75-125	0.384	25	QM-07
Lead	35.4	0.144	"	26.3	3.27	122	75-125	2.63	25	
Nickel	87.1	0.144	"	52.7	24.5	119	75-125	2.80	25	
Selenium	11.2	0.0722	"	5.27	6.52	89.3	75-125	6.42	25	
Silver	3.08	0.144	"	2.63	0.151	111	75-125	3.85	25	
Zinc	158	14.4	"	52.7	81.1	147	75-125	1.11	25	QM-07

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Total Metals by EPA Method 200.8 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506271 - EPA 200.8

Blank (1506271-BLK1)

Prepared & Analyzed: 06/22/15

Calcium	ND	0.0500	mg/L
Iron	ND	0.0500	"
Magnesium	ND	0.0500	"
Manganese	ND	0.00100	"
Potassium	ND	0.0500	"
Sodium	ND	0.0500	"

LCS (1506271-BS1)

Prepared & Analyzed: 06/22/15

Calcium	5.35	0.0500	mg/L	5.00	107	85-115
Iron	5.27	0.0500	"	5.00	105	85-115
Magnesium	5.36	0.0500	"	5.00	107	85-115
Manganese	0.531	0.00100	"	0.500	106	85-115
Potassium	5.24	0.0500	"	5.00	105	85-115
Sodium	5.52	0.0500	"	5.00	110	85-115

Duplicate (1506271-DUP1)

Source: 1506164-01

Prepared & Analyzed: 06/22/15

Calcium	61.8	0.0500	mg/L	68.7	10.5	20
Iron	5.22	0.0500	"	5.66	8.01	20
Magnesium	19.4	0.0500	"	18.4	5.70	20
Manganese	0.694	0.00100	"	0.746	7.14	20
Potassium	8.45	0.0500	"	8.35	1.16	20
Sodium	214	0.0500	"	207	3.47	20

Matrix Spike (1506271-MS1)

Source: 1506164-01

Prepared & Analyzed: 06/22/15

Calcium	66.8	0.0500	mg/L	5.00	68.7	NR	75-125	QM-07
Iron	10.0	0.0500	"	5.00	5.66	87.6	75-125	
Magnesium	23.5	0.0500	"	5.00	18.4	103	75-125	
Manganese	1.19	0.00100	"	0.500	0.746	88.6	75-125	
Potassium	12.3	0.0500	"	5.00	8.35	79.7	75-125	
Sodium	203	0.0500	"	5.00	207	NR	75-125	QM-07

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Total Metals by EPA Method 200.8 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506271 - EPA 200.8

Matrix Spike Dup (1506271-MSD1)				Source: 1506164-01			Prepared & Analyzed: 06/22/15				
Calcium	67.4	0.0500	mg/L	5.00	68.7	NR	75-125	0.854	25		QM-07
Iron	10.7	0.0500	"	5.00	5.66	102	75-125	6.83	25		
Magnesium	24.8	0.0500	"	5.00	18.4	128	75-125	5.16	25		QM-07
Manganese	1.26	0.00100	"	0.500	0.746	103	75-125	5.90	25		
Potassium	13.1	0.0500	"	5.00	8.35	94.3	75-125	5.72	25		
Sodium	217	0.0500	"	5.00	207	197	75-125	6.76	25		QM-07

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Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Total Mercury by EPA Method 7471 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506279 - EPA 7471A

Blank (1506279-BLK1)					Prepared: 06/22/15 Analyzed: 06/23/15					
Mercury	ND	0.0500	mg/kg wet							
LCS (1506279-BS1)					Prepared: 06/22/15 Analyzed: 06/23/15					
Mercury	0.464	0.0500	mg/kg wet	0.500		92.9	80-120			
Duplicate (1506279-DUP1)					Source: 1506171-01 Prepared: 06/22/15 Analyzed: 06/23/15					
Mercury	0.0396	0.0722	mg/kg dry		0.0469			16.7	20	
Matrix Spike (1506279-MS1)					Source: 1506171-01 Prepared: 06/22/15 Analyzed: 06/23/15					
Mercury	0.612	0.0655	mg/kg dry	0.655	0.0469	86.2	80-120			
Matrix Spike Dup (1506279-MSD1)					Source: 1506171-01 Prepared: 06/22/15 Analyzed: 06/23/15					
Mercury	0.692	0.0722	mg/kg dry	0.714	0.0469	90.3	80-120	12.4	20	

Summit Scientific

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PO Box 1625
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Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Hexavalent Chromium by EPA 7196 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506273 - 3060A_Mod

Blank (1506273-BLK1)

Prepared: 06/22/15 Analyzed: 06/23/15

Chromium, Hexavalent ND 1.00 mg/kg wet

LCS (1506273-BS1)

Prepared: 06/22/15 Analyzed: 06/23/15

Chromium, Hexavalent 21.6 1.00 mg/kg wet 19.9 108 80-120

Duplicate (1506273-DUP1)

Source: 1506162-01

Prepared: 06/22/15 Analyzed: 06/23/15

Chromium, Hexavalent ND 1.37 mg/kg dry ND 20

Matrix Spike (1506273-MS1)

Source: 1506162-01

Prepared: 06/22/15 Analyzed: 06/23/15

Chromium, Hexavalent 92.1 1.37 mg/kg dry 101 ND 91.3 80-120

Matrix Spike (1506273-MS2)

Source: 1506194-01

Prepared: 06/22/15 Analyzed: 06/23/15

Chromium, Hexavalent 65.2 1.19 mg/kg dry 94.6 0.537 68.3 80-120 QM-07

Summit Scientific

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Anions by EPA Method 300.0 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506343 - General Preparation

Blank (1506343-BLK1)

Prepared: 06/26/15 Analyzed: 06/29/15

Fluoride	ND	0.100	mg/kg
Bromide	ND	0.100	"
Chloride	ND	0.100	"
Sulfate	ND	0.100	"

LCS (1506343-BS1)

Prepared & Analyzed: 06/26/15

Chloride	29.4	0.100	mg/kg	30.0	98.1	90-110
Sulfate	140	0.100	"	150	93.2	90-110

Duplicate (1506343-DUP1)

Source: 1506114-01

Prepared & Analyzed: 06/26/15

Bromide	ND	10.0	mg/kg	24.3		10
Fluoride	ND	10.0	"	0.00		10
Sulfate	5920	10.0	"	5890	0.493	10
Chloride	31300	10.0	"	31000	1.01	10

Matrix Spike (1506343-MS1)

Source: 1506114-01

Prepared & Analyzed: 06/26/15

Sulfate	79200	10.0	mg/kg	72800	5890	101	90-110
Chloride	43500	10.0	"	14600	31000	85.7	90-110

QM-07

Batch 1506345 - General Preparation

Blank (1506345-BLK1)

Prepared & Analyzed: 06/26/15

Bromide	ND	0.500	mg/L
Fluoride	ND	4.50	"
Chloride	ND	50.0	"
Sulfate	ND	50.0	"

Summit Scientific

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Anions by EPA Method 300.0 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506345 - General Preparation

LCS (1506345-BS1)

Prepared & Analyzed: 06/26/15

Bromide	475	0.500	mg/L	500	95.1	90-110
Chloride	141	50.0	"	150	94.2	90-110
Sulfate	720	50.0	"	750	96.0	90-110
Fluoride	104	4.50	"	100	104	90-110

Duplicate (1506345-DUP1)

Source: 1506162-02

Prepared: 06/26/15 Analyzed: 06/29/15

Sulfate	921	50.0	mg/L	906	1.64	10
Chloride	628	50.0	"	630	0.223	10
Bromide	2.50	0.500	"	2.40	4.08	10
Fluoride	24.0	4.50	"	24.8	3.28	10

Matrix Spike (1506345-MS1)

Source: 1506162-02

Prepared: 06/26/15 Analyzed: 06/29/15

Chloride	161	50.0	mg/L	150	630	NR	90-110	QM-07
Sulfate	275	50.0	"	750	906	NR	90-110	QM-07
Fluoride	16.6	4.50	"	100	24.8	NR	90-110	QM-07
Bromide	112	0.500	"	500	2.40	22.0	90-110	QM-07

Summit Scientific

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1506252 - General Preparation

Duplicate (1506252-DUP1)		Source: 1506171-01		Prepared: 06/19/15 Analyzed: 06/22/15	
% Solids	70.4		%	69.3	1.57 20

Summit Scientific

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Kinetic Energy
PO Box 1625
Loveland CO, 80539

Project: Frontier 8
Project Number: Arellano Q 10-9HN
Project Manager: Shad Martin

Reported:
06/29/15 17:02

Notes and Definitions

QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

Summit Scientific

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