

# Summit Scientific

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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,



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

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

# Summit Scientific

S<sub>2</sub>

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 <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	GC/MS/DOC	90 Mult	Br, Cl, F, S <sub>2</sub>	Ca, Fe, Mg	Mn, K, Na		
1	CUTTINGS FIB	6-18	10:00	1		X													
2	drill mud 80	6-18	10:45	1			X												
3	12794 ↓																		
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Relinquished by: [Signature] Date/Time: 6-18-15 12:43  
Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Turn Around Time (Check):  
Same Day \_\_\_\_\_ 72 hours \_\_\_\_\_  
24 hours \_\_\_\_\_ Standard \_\_\_\_\_  
48 hours \_\_\_\_\_  
Sample Integrity:  
Temperature Upon Receipt: 36  
Intact:  Yes  No

Notes:  
Need by 25th EOB  
cred: +

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Project Number: Arellano Q 10-9HN  
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**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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<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) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, etc.			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
<sup>(1)</sup> 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

06-18-15  
 Date/Time

[Signature]



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**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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**Cuttings 8@12794'**  
**1506163-01 (Soil)**

**Summit Scientific**

**Total Metals by EPA Method 6020 - Dry Weight Basis**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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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**1506163-01 (Soil)**

**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
<b>Chloride</b>	<b>544</b>	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
<b>Fluoride</b>	<b>28.9</b>	0.100	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sulfate</b>	<b>372</b>	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
<b>% Solids</b>	<b>46.0</b>		%	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
<b>C10-C28 (DRO)</b>	<b>213</b>	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
<b>Benzene</b>	<b>120</b>	10	ug/l	10	1506245	06/19/15	06/19/15	EPA 8260B	
<b>Toluene</b>	<b>870</b>	10	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>170</b>	10	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>2400</b>	10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>56000</b>	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
<b>Calcium</b>	<b>6250</b>	0.0500	mg/L	1	1506271	06/22/15	06/22/15	EPA 200.8	

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**Reported:**  
06/29/15 17:02

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

**Summit Scientific**

**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
<b>Iron</b>	<b>627</b>	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
<b>Potassium</b>	<b>48.3</b>	0.0500	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Magnesium</b>	<b>59.2</b>	0.0500	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Manganese</b>	<b>14.4</b>	0.00100	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium</b>	<b>488</b>	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
<b>Bromide</b>	<b>6.30</b>	0.500	mg/L	1	1506345	06/26/15	06/29/15	EPA 300.0	

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 06/29/15 17:02

**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
<b>Chloride</b>	<b>524</b>	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
<b>Fluoride</b>	<b>9.15</b>	4.50	"	"	"	"	"	"	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sulfate</b>	<b>323</b>	50.0	"	"	"	"	"	"	

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

Reported:  
06/29/15 17:02

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 1506243 - EPA 3550A**

<b>Blank (1506243-BLK1)</b>										
										Prepared & Analyzed: 06/18/15
C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: <i>o</i> -Terphenyl	14.7		"	12.2		121	30-150			
<b>LCS (1506243-BS1)</b>										
										Prepared & Analyzed: 06/18/15
C10-C28 (DRO)	575	50	mg/kg	501		115	73-134			
Surrogate: <i>o</i> -Terphenyl	14.2		"	12.2		117	30-150			
<b>Matrix Spike (1506243-MS1)</b>										
										Source: 1506158-04
										Prepared & Analyzed: 06/18/15
C10-C28 (DRO)	556	50	mg/kg	460	9.89	119	50-148			
Surrogate: <i>o</i> -Terphenyl	12.5		"	11.2		111	30-150			
<b>Matrix Spike Dup (1506243-MSD1)</b>										
										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: <i>o</i> -Terphenyl	13.3		"	11.4		117	30-150			

**Batch 1506288 - EPA 3520B**

<b>Blank (1506288-BLK1)</b>										
										Prepared: 06/22/15 Analyzed: 06/23/15
C10-C28 (DRO)	ND	5.00	mg/L							
Surrogate: <i>o</i> -Terphenyl	12.2		"	12.2		100	47.2-150			
<b>LCS (1506288-BS1)</b>										
										Prepared: 06/22/15 Analyzed: 06/23/15
C10-C28 (DRO)	509	5.00	mg/L	501		102	80-149			
Surrogate: <i>o</i> -Terphenyl	12.4		"	12.2		102	47.2-150			
<b>LCS Dup (1506288-BSD1)</b>										
										Prepared: 06/22/15 Analyzed: 06/23/15
C10-C28 (DRO)	527	5.00	mg/L	501		105	80-149	3.37	14	
Surrogate: <i>o</i> -Terphenyl	12.8		"	12.2		105	47.2-150			

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

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

**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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**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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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

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

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

**Batch 1506246 - EPA 5030 Soil MS**

<b>Matrix Spike (1506246-MS1)</b>	<b>Source: 1506159-01</b>			<b>Prepared &amp; Analyzed: 06/18/15</b>						
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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0389</i>		<i>"</i>	<i>0.0386</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0379</i>		<i>"</i>	<i>0.0390</i>		<i>97.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0387</i>		<i>"</i>	<i>0.0390</i>		<i>99.2</i>	<i>21-167</i>			

<b>Matrix Spike Dup (1506246-MSD1)</b>	<b>Source: 1506159-01</b>			<b>Prepared &amp; Analyzed: 06/18/15</b>						
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	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0379</i>		<i>"</i>	<i>0.0371</i>		<i>102</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0362</i>		<i>"</i>	<i>0.0375</i>		<i>96.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0360</i>		<i>"</i>	<i>0.0375</i>		<i>96.2</i>	<i>21-167</i>			

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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

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

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

**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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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 Units	Source		%REC		RPD		Notes
	Result	Limit		Result	%REC	Limits	RPD	Limit		

**Batch 1506248 - EPA 3050B**

<b>Matrix Spike (1506248-MS1)</b>		<b>Source: 1506171-01</b>		<b>Prepared &amp; Analyzed: 06/19/15</b>						
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

<b>Matrix Spike Dup (1506248-MSD1)</b>		<b>Source: 1506171-01</b>		<b>Prepared &amp; Analyzed: 06/19/15</b>						
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  
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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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

**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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 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	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 1506271 - EPA 200.8**

<b>Matrix Spike Dup (1506271-MSD1)</b>	<b>Source: 1506164-01</b>			<b>Prepared &amp; Analyzed: 06/22/15</b>						
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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

**Batch 1506279 - EPA 7471A**

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

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

**Batch 1506273 - 3060A\_Mod**

<b>Blank (1506273-BLK1)</b>		Prepared: 06/22/15 Analyzed: 06/23/15									
Chromium, Hexavalent	ND	1.00	mg/kg wet								
<b>LCS (1506273-BS1)</b>		Prepared: 06/22/15 Analyzed: 06/23/15									
Chromium, Hexavalent	21.6	1.00	mg/kg wet	19.9	108	80-120					
<b>Duplicate (1506273-DUP1)</b>		<b>Source: 1506162-01</b>		Prepared: 06/22/15 Analyzed: 06/23/15							
Chromium, Hexavalent	ND	1.37	mg/kg dry		ND					20	
<b>Matrix Spike (1506273-MS1)</b>		<b>Source: 1506162-01</b>		Prepared: 06/22/15 Analyzed: 06/23/15							
Chromium, Hexavalent	92.1	1.37	mg/kg dry	101	ND	91.3	80-120				
<b>Matrix Spike (1506273-MS2)</b>		<b>Source: 1506194-01</b>		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

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 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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

**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	"							

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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 Level	Source		%REC		RPD		Notes
	Result	Limit		Units	Result	%REC	Limits	RPD	Limit	

**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

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

**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	

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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

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*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*