



LEGEND

- BACKGROUND ARSENIC SAMPLE (mg/kg)
- D90 REMEDIATION SITE LOCATION



IMAGE COURTESY OF ESRI



FIGURE 1
ARSENIC SITE MAP
JACKSON COUNTY, COLORADO



D90 ENERGY, LLC

**TABLE 1
BACKGROUND SOIL ANALYTICAL RESULTS**

**JACKSON COUNTY, COLORADO
D90 ENERGY, LLC**

Location	Sample ID	Arsenic (mg/kg)	Latitude	Longitude
Gregory 5-09H	BG01	4.04	40.585331	-106.387264
	BG02	6.09		
	BG03	1.91		
	BG04	1.87		
Hebron 1-18H	BG01@0-6"	2.99	40.584117	-106.414345
	BG02@0-6"	3.51		
	BG03@0-6"	3.32		
	BG04@0-6"	2.13		
Mutual 7 Pad	BG01	4.01	40.583408	-106.406314
	BG02	4.47		
	BG03	4.99		
	BG04	3.76		
Evans 2-21H & Ray Ranch 7-21H	BG01	2.44	40.569775	-106.374985
	BG02	2.97		
	BG03	2.97		
	BG04	2.61		
Marr Pad	BG01	1.61	40.598325	-106.415653
	BG02	0.00201		
	BG03	1.43		
	BG04	2.82		
Open Range	OR BG01 N	2.76	40.571183	-106.424278
	OR BG02 E	2.46		
	OR BG03 S	3.16		
	OR BG04 W	2.68		
Ray Ranch West	RR BG01 N	0.235	40.573847	-106.382212
	RR BG02 E	0.354		
	RR BG03 S	0.534		
	RR BG04 W	0.677		

Notes:

All samples are reported in milligrams per kilogram (mg/kg)

All samples were collected from 0-6 inches below ground surface (bgs)

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 29, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: Marr Background

Enclosed are the results of analyses for samples received by Summit Scientific on 08/24/16 16:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
08/29/16 13:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG01	1608198-01	Soil	08/23/16 15:25	08/24/16 16:00
BG02	1608198-02	Soil	08/23/16 15:11	08/24/16 16:00
BG03	1608198-03	Soil	08/23/16 16:00	08/24/16 16:00
BG04	1608198-04	Soil	08/23/16 15:45	08/24/16 16:00

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
08/29/16 13:41

Sample Receipt Checklist

S2 Work Order: 1608198

Client: LTE

Client Project ID: Marr background

Shipped Via: PIU

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	<u>5.4</u>				

Thermometer ID: 61857155-K

	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, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<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):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

8/24/16 1700
Date/Time



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
08/29/16 13:41

BG01
1608198-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **08/23/16 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.61	0.202	mg/kg dry	1	1608231	08/25/16	08/25/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **08/23/16 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	364	11.4	mg/kg dry	1	1608264	08/29/16	08/29/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	142	5.72	"	"	"	"	"	"	
Sodium	15.1	5.72	"	"	"	"	"	"	

Date Sampled: **08/23/16 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.170		units	"	1608283	08/29/16	08/29/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/23/16 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.0822	0.0100	mmhos/cm	1	1608281	08/29/16	08/29/16	SM 2510B	

Date Sampled: **08/23/16 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.84	0.100	pH Units	"	1608280	08/29/16	08/29/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 08/29/16 13:41

BG01
1608198-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/23/16 15:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.4		%	1	1608260	08/25/16	08/28/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 08/29/16 13:41

BG02
1608198-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **08/23/16 15:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.00201	0.000603	mg/kg dry	1	1608231	08/25/16	08/25/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/23/16 15:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	88.2		%	1	1608260	08/25/16	08/28/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 08/29/16 13:41

BG03
1608198-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **08/23/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.43	0.227	mg/kg dry	1	1608231	08/25/16	08/25/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/23/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	79.1		%	1	1608260	08/25/16	08/28/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 08/29/16 13:41

BG04
1608198-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **08/23/16 15:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.82	0.242	mg/kg dry	1	1608231	08/25/16	08/25/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/23/16 15:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	70.7		%	1	1608260	08/25/16	08/28/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 08/29/16 13:41

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 1608231 - EPA 3050B

Blank (1608231-BLK1)

Prepared: 08/23/16 Analyzed: 08/25/16

Arsenic ND 0.200 mg/kg wet

LCS (1608231-BS1)

Prepared: 08/23/16 Analyzed: 08/25/16

Arsenic 53.0 0.200 mg/kg wet 52.8 100 82.6-117

Duplicate (1608231-DUP1)

Source: 1608175-01

Prepared: 08/23/16 Analyzed: 08/25/16

Arsenic 2.15 0.234 mg/kg dry 2.05 4.55 20

Matrix Spike (1608231-MS1)

Source: 1608175-01

Prepared: 08/23/16 Analyzed: 08/25/16

Arsenic 53.0 0.234 mg/kg dry 46.7 2.05 109 75-125

Matrix Spike Dup (1608231-MSD1)

Source: 1608175-01

Prepared: 08/23/16 Analyzed: 08/25/16

Arsenic 56.3 0.234 mg/kg dry 46.7 2.05 116 75-125 5.94 25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Marr Background
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
08/29/16 13:41

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1608264 - General Preparation

Blank (1608264-BLK1)

Prepared & Analyzed: 08/29/16

Calcium	ND	10.0	mg/kg wet					
Magnesium	ND	5.00	"					
Sodium	ND	5.00	"					

LCS (1608264-BS1)

Prepared & Analyzed: 08/29/16

Calcium	538	10.0	mg/kg wet	500	108	82.9-118		
Magnesium	508	5.00	"	500	102	77.1-123		
Sodium	514	5.00	"	500	103	71-129		

Duplicate (1608264-DUP1)

Source: 1608198-01

Prepared & Analyzed: 08/29/16

Calcium	291	11.4	mg/kg dry	364			22.3	200
Magnesium	109	5.72	"	142			26.0	200
Sodium	10.2	5.72	"	15.1			38.6	200

Matrix Spike (1608264-MS1)

Source: 1608198-01

Prepared & Analyzed: 08/29/16

Calcium	977	11.4	mg/kg dry	572	364	107	75-125	
Magnesium	755	5.72	"	572	142	107	75-125	
Sodium	639	5.72	"	572	15.1	109	75-125	

Matrix Spike Dup (1608264-MSD1)

Source: 1608198-01

Prepared & Analyzed: 08/29/16

Calcium	993	11.4	mg/kg dry	572	364	110	75-125	1.63	25
Magnesium	737	5.72	"	572	142	104	75-125	2.36	25
Sodium	616	5.72	"	572	15.1	105	75-125	3.67	25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Marr Background
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
08/29/16 13:41

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

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

Batch 1608260 - General Preparation

Duplicate (1608260-DUP1)	Source: 1608197-01			Prepared: 08/25/16 Analyzed: 08/28/16							
% Solids	92.4		%		92.1				0.358	20	

Batch 1608280 - General Preparation

LCS (1608280-BS1)				Prepared & Analyzed: 08/29/16							
pH	8.01	0.100	pH Units	8.00	100	95-105					
Duplicate (1608280-DUP1)	Source: 1608198-01			Prepared & Analyzed: 08/29/16							
pH	6.94	0.100	pH Units	6.84				1.45	20		

Batch 1608281 - General Preparation

Blank (1608281-BLK1)				Prepared & Analyzed: 08/29/16							
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
LCS (1608281-BS1)				Prepared & Analyzed: 08/29/16							
Specific Conductance (EC)	0.503	0.0100	mmhos/cm	0.500	101	90-110					
Duplicate (1608281-DUP1)	Source: 1608198-01			Prepared & Analyzed: 08/29/16							
Specific Conductance (EC)	0.0918	0.0100	mmhos/cm	0.0822				11.1	20		

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Marr Background

Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
08/29/16 13:41

Notes and Definitions

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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TABLE 1
BACKGROUND SOIL SAMPLING ANALYTICAL RESULTS
HEBRON 1-18H OIL AND GAS LOCATION

SANDRIDGE ENERGY, INC.

Parameter	COGCC Table 910-1 Concentration Levels	Units	BG01@0-6"	BG02@0-6"	BG03@0-6"	BG04@0-6"
Sample Date			2/24/2016	2/24/2016	2/24/2016	2/24/2016
Sample Type			Background	Background	Background	Background
Depth (feet bgs)			0-0.50	0-0.50	0-0.50	0-0.50
Benzene	0.17	mg/kg	--	--	--	--
Toluene	85	mg/kg	--	--	--	--
Ethylbenzene	100	mg/kg	--	--	--	--
Total Xylenes	175	mg/kg	--	--	--	--
TEPH-DRO	--	mg/kg	--	--	--	--
TVPH-GRO	--	mg/kg	--	--	--	--
TPH Total	500	mg/kg	--	--	--	--
Arsenic	0.39	mg/kg	2.99	3.51	3.32	2.13
Barium	15,000	mg/kg	--	--	--	--
Cadmium	70	mg/kg	--	--	--	--
Chromium (III)	120,000	mg/kg	--	--	--	--
Chromium (VI)	23	mg/kg	--	--	--	--
Copper	3,100	mg/kg	--	--	--	--
Lead	400	mg/kg	--	--	--	--
Mercury	23	mg/kg	--	--	--	--
Nickel	1,600	mg/kg	--	--	--	--
Selenium	390	mg/kg	--	--	--	--
Silver	390	mg/kg	--	--	--	--
Zinc	23,000	mg/kg	--	--	--	--
Acenaphthene	1,000	mg/kg	--	--	--	--
Anthracene	1,000	mg/kg	--	--	--	--
Benzo (A) anthracene	0.22	mg/kg	--	--	--	--
Benzo (B) fluoranthene	0.22	mg/kg	--	--	--	--
Benzo (K) fluoranthene	2.2	mg/kg	--	--	--	--
Benzo (A) pyrene	0.022	mg/kg	--	--	--	--
Chrysene	22	mg/kg	--	--	--	--
Dibenzo (A,H) anthracene	0.022	mg/kg	--	--	--	--
Fluoranthene	1,000	mg/kg	--	--	--	--
Fluorene	1,000	mg/kg	--	--	--	--
Indeno (1,2,3,C,D) pyrene	0.22	mg/kg	--	--	--	--
Napthalene	23	mg/kg	--	--	--	--
Pyrene	1,000	mg/kg	--	--	--	--
EC	4	mmhos/cm	0.303	0.395	0.290	0.447
pH	6 - 9	SU	6.36	6.83	6.40	7.63
SAR	12	unitless	0.192	0.176	0.290	0.218

NOTES:

BOLD - indicates result exceeds the COGCC Table 910-1 Concentration Level

bgs - below ground surface

COGCC - colorado oil and gas conservation commission

EC - electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter in saturated paste extract

SAR - sodium adsorption ratio

SU - standard unit on saturated paste

TEPH-DRO - total extractable petroleum hydrocarbon-diesel range organics

TVPH-GRO - total volume petroleum hydrocarbon-gasoline range organics

TPH - total petroleum hydrocarbons

-- - not analyzed/no standard

< - less than the stated analytical reporting limit



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 02, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: Hebron 1-18H

Enclosed are the results of analyses for samples received by Summit Scientific on 02/25/16 10:05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG01@0-6"	1602198-01	Soil	02/24/16 12:00	02/25/16 10:05
BG02@0-6"	1602198-02	Soil	02/24/16 12:15	02/25/16 10:05
BG03@0-6"	1602198-03	Soil	02/24/16 12:30	02/25/16 10:05
BG04@0-6"	1602198-04	Soil	02/24/16 12:45	02/25/16 10:05

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H

Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

Summit Scientific

1602198

S₂

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

Page 1 of 1

Client: LTE Project Manager: Brett Forkner
Address: 4600 W 60th Ave E-Mail: bforkner@ltenv.com
City/State/Zip: Arvada CO 80003
Phone: 303 433 9788 Fax: _____ Project Name: Hebron 1-18H
Sampler Name: G Maniz Project Number: 065815003.003

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	SAR	EC	pH	Arisealic	
1	BG01 @ 0-6"	2/24/16	1200	1			/						/	/	/		
2	BG02 @ 0-6"	↓	1215	1			/						/	/	/		
3	BG03 @ 0-6"	↓	1230	1			/						/	/	/		
4	BG04 @ 0-6"	↓	1245	1			/						/	/	/		
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished by: <u>[Signature]</u> Date/Time: <u>2/25/16 10:05</u>	Received by: <u>[Signature]</u> Date/Time: <u>2/25/16 10:05</u>	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 hours <input type="checkbox"/> Sample Integrity: Temperature Upon Receipt: <u>3.6°C</u> Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	Notes: <u>on ice</u>
Relinquished by: <u>[Signature]</u> Date/Time: <u>2/25/16 10:30</u>	Received by: <u>[Signature]</u> Date/Time: <u>2/25/16 10:30</u>		
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____		

www.s2scientific.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

BG01@0-6"
1602198-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **02/24/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.99	0.160	mg/kg dry	1	1602271	02/29/16	02/29/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **02/24/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	285	14.4	mg/kg dry	1	1602272	02/29/16	02/29/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	126	7.21	"	"	"	"	"	"	
Sodium	15.5	7.21	"	"	"	"	"	"	

Date Sampled: **02/24/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.192		units	"	1603001	03/01/16	03/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.303	0.0100	mmhos/cm	1	1602250	02/25/16	02/25/16	SM 2510B	

Date Sampled: **02/24/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.36	0.100	pH Units	"	1602249	02/25/16	02/25/16	EPA 9045	

Summit Scientific

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.



LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Hebron 1-18H

Project Number: 065815003-003
 Project Manager: Brett Forkner

Reported:
 03/02/16 09:15

BG01@0-6"
1602198-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	62.5		%	1	1602273	02/29/16	03/02/16	% calculation	

Summit Scientific

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.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

BG02@0-6"
1602198-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **02/24/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.51	0.153	mg/kg dry	1	1602271	02/29/16	02/29/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **02/24/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	651	15.6	mg/kg dry	1	1602272	02/29/16	02/29/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	156	7.80	"	"	"	"	"	"	
Sodium	19.3	7.80	"	"	"	"	"	"	

Date Sampled: **02/24/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.176		units	"	1603001	03/01/16	03/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.395	0.0100	mmhos/cm	1	1602250	02/25/16	02/25/16	SM 2510B	

Date Sampled: **02/24/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.83	0.100	pH Units	"	1602249	02/25/16	02/25/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Hebron 1-18H
 Project Number: 065815003-003
 Project Manager: Brett Forkner

Reported:
 03/02/16 09:15

BG02@0-6"
1602198-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	57.5		%	1	1602273	02/29/16	03/02/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

**BG03@0-6''
1602198-03 (Soil)**

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **02/24/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.32	0.197	mg/kg dry	1	1602271	02/29/16	02/29/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **02/24/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	295	22.0	mg/kg dry	1	1602272	02/29/16	02/29/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	160	11.0	"	"	"	"	"	"	
Sodium	34.8	11.0	"	"	"	"	"	"	

Date Sampled: **02/24/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.405		units	"	1603001	03/01/16	03/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.290	0.0100	mmhos/cm	1	1602250	02/25/16	02/25/16	SM 2510B	

Date Sampled: **02/24/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.40	0.100	pH Units	"	1602249	02/25/16	02/25/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Hebron 1-18H
 Project Number: 065815003-003
 Project Manager: Brett Forkner

Reported:
 03/02/16 09:15

BG03@0-6"
1602198-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	45.4		%	1	1602273	02/29/16	03/02/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

BG04@0-6"
1602198-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **02/24/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.13	0.107	mg/kg dry	1	1602271	02/29/16	02/29/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **02/24/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	308	12.0	mg/kg dry	1	1602272	02/29/16	02/29/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	114	5.99	"	"	"	"	"	"	
Sodium	17.6	5.99	"	"	"	"	"	"	

Date Sampled: **02/24/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.218		units	"	1603001	03/01/16	03/02/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.447	0.0100	mmhos/cm	1	1602250	02/25/16	02/25/16	SM 2510B	

Date Sampled: **02/24/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.63	0.100	pH Units	"	1602249	02/25/16	02/25/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Hebron 1-18H

Project Number: 065815003-003
 Project Manager: Brett Forkner

Reported:
 03/02/16 09:15

BG04@0-6"
1602198-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/24/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	83.5		%	1	1602273	02/29/16	03/02/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Hebron 1-18H
 Project Number: 065815003-003
 Project Manager: Brett Forkner

Reported:
 03/02/16 09:15

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 1602271 - EPA 3050B

Blank (1602271-BLK1)				Prepared & Analyzed: 02/29/16						
Arsenic	0.325	0.100	mg/kg wet							
LCS (1602271-BS1)				Prepared & Analyzed: 02/29/16						
Arsenic	113	0.100	mg/kg wet	127	88.7	59-110				
Duplicate (1602271-DUP1)				Source: 1602197-01		Prepared & Analyzed: 02/29/16				
Arsenic	7.49	0.119	mg/kg dry		7.66			2.29	20	
Matrix Spike (1602271-MS1)				Source: 1602197-01		Prepared & Analyzed: 02/29/16				
Arsenic	57.1	0.119	mg/kg dry	46.5	7.66	106	75-125			
Matrix Spike Dup (1602271-MSD1)				Source: 1602197-01		Prepared & Analyzed: 02/29/16				
Arsenic	56.5	0.119	mg/kg dry	47.1	7.66	104	75-125	1.07	25	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1602272 - General Preparation

Blank (1602272-BLK1)

Prepared & Analyzed: 02/29/16

Calcium	ND	10.0	mg/kg wet						
Magnesium	ND	5.00	"						
Sodium	ND	5.00	"						

LCS (1602272-BS1)

Prepared & Analyzed: 02/29/16

Calcium	530	10.0	mg/kg wet	500	106	82.9-118			
Magnesium	554	5.00	"	500	111	77.1-123			
Sodium	563	5.00	"	500	113	71-129			

Duplicate (1602272-DUP1)

Source: 1602197-01

Prepared & Analyzed: 02/29/16

Calcium	11400	9.28	mg/kg dry	11700			2.46	200	
Magnesium	639	4.64	"	653			2.16	200	
Sodium	1870	4.64	"	1860			0.676	200	

Matrix Spike (1602272-MS1)

Source: 1602197-01

Prepared & Analyzed: 02/29/16

Calcium	12500	9.28	mg/kg dry	464	11700	169	75-125		QM-07
Magnesium	1200	4.64	"	464	653	117	75-125		
Sodium	2400	4.64	"	464	1860	118	75-125		

Matrix Spike Dup (1602272-MSD1)

Source: 1602197-01

Prepared & Analyzed: 02/29/16

Calcium	15000	9.28	mg/kg dry	464	11700	712	75-125	18.3	25	QM-07
Magnesium	1420	4.64	"	464	653	164	75-125	16.8	25	QM-07
Sodium	2320	4.64	"	464	1860	99.6	75-125	3.53	25	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

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

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

Batch 1602249 - General Preparation

LCS (1602249-BS1)					Prepared & Analyzed: 02/25/16					
pH	8.02	0.100	pH Units	8.00	100	95-105				
Duplicate (1602249-DUP1)					Source: 1602191-01 Prepared & Analyzed: 02/25/16					
pH	8.30	0.100	pH Units	8.25	0.604	20				

Batch 1602250 - General Preparation

Blank (1602250-BLK1)					Prepared & Analyzed: 02/25/16					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1602250-BS1)					Prepared & Analyzed: 02/25/16					
Specific Conductance (EC)	0.512	0.0100	mmhos/cm	0.500	102	90-110				
Duplicate (1602250-DUP1)					Source: 1602191-01 Prepared & Analyzed: 02/25/16					
Specific Conductance (EC)	1.08	0.0100	mmhos/cm	1.15	6.37	20				

Batch 1602273 - General Preparation

Duplicate (1602273-DUP1)					Source: 1602197-01 Prepared: 02/29/16 Analyzed: 03/02/16					
% Solids	84.6		%	84.3	0.425	20				

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Hebron 1-18H
Project Number: 065815003-003
Project Manager: Brett Forkner

Reported:
03/02/16 09:15

Notes and Definitions

- 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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TABLE 1
BACKGROUND SOIL SAMPLING ANALYTICAL RESULTS
MUTUAL 7 OIL AND GAS LOCATION

SANDRIDGE ENERGY, INC.

Parameter	COGCC Table 910-1 Concentration Levels	Units	BG01	BG02	BG03	BG04
Sample Date			3/22/2016	3/22/2016	3/22/2016	3/22/2016
Sample Type			Background	Background	Background	Background
Depth (feet bgs)			0-0.5	0-0.5	0-0.5	0-0.5
Benzene	0.17	mg/kg	--	--	--	--
Toluene	85	mg/kg	--	--	--	--
Ethylbenzene	100	mg/kg	--	--	--	--
Total Xylenes	175	mg/kg	--	--	--	--
TEPH-DRO	--	mg/kg	--	--	--	--
TVPH-GRO	--	mg/kg	--	--	--	--
TPH Total	500	mg/kg	--	--	--	--
Arsenic	0.39	mg/kg	4.01	4.47	4.99	3.76
Barium	15,000	mg/kg	--	--	--	--
Cadmium	70	mg/kg	--	--	--	--
Chromium (III)	120,000	mg/kg	--	--	--	--
Chromium (VI)	23	mg/kg	--	--	--	--
Copper	3,100	mg/kg	--	--	--	--
Lead	400	mg/kg	--	--	--	--
Mercury	23	mg/kg	--	--	--	--
Nickel	1,600	mg/kg	--	--	--	--
Selenium	390	mg/kg	--	--	--	--
Silver	390	mg/kg	--	--	--	--
Zinc	23,000	mg/kg	--	--	--	--
Acenaphthene	1,000	mg/kg	--	--	--	--
Anthracene	1,000	mg/kg	--	--	--	--
Benzo (A) anthracene	0.22	mg/kg	--	--	--	--
Benzo (B) fluoranthene	0.22	mg/kg	--	--	--	--
Benzo (K) fluoranthene	2.2	mg/kg	--	--	--	--
Benzo (A) pyrene	0.022	mg/kg	--	--	--	--
Chrysene	22	mg/kg	--	--	--	--
Dibenzo (A,H) anthracene	0.022	mg/kg	--	--	--	--
Fluoranthene	1,000	mg/kg	--	--	--	--
Fluorene	1,000	mg/kg	--	--	--	--
Indeno (1,2,3,C,D) pyrene	0.22	mg/kg	--	--	--	--
Napthalene	23	mg/kg	--	--	--	--
Pyrene	1,000	mg/kg	--	--	--	--
EC	4	mmhos/cm	2.96	3.99	0.431	0.615
pH	6 - 9	SU	8.05	7.29	6.33	6.88
SAR	12	unitless	3.09	2.67	0.389	1.33

NOTES:

BOLD - indicates result exceeds the COGCC Table 910-1 Concentration Level

bgs - below ground surface

COGCC - colorado oil and gas conservation commission

EC - electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter in saturated paste extract

SAR - sodium adsorption ratio

SU - standard unit on saturated paste

TEPH-DRO - total extractable petroleum hydrocarbon-diesel range organics

TVPH-GRO - total volume petroleum hydrocarbon-gasolene range organics

TPH - total petroleum hydrocarbons

-- - not analyzed/no standard

< - less than the stated analytical reporting limit



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 29, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: Mutual 7 Pad

Enclosed are the results of analyses for samples received by Summit Scientific on 03/22/16 16:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michelle Clements", with a stylized flourish at the end.

Michelle Clements For Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad

Project Number: 065815003.003

Project Manager: Brett Forkner

Reported:
03/29/16 14:37

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG01	1603158-01	Soil	03/22/16 11:45	03/22/16 16:30
BG02	1603158-02	Soil	03/22/16 11:52	03/22/16 16:30
BG03	1603158-03	Soil	03/22/16 11:59	03/22/16 16:30
BG04	1603158-04	Soil	03/22/16 12:05	03/22/16 16:30

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad

Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

Summit Scientific

1603158

741 Corporate Circle Suite 1 ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: LTE
Address: 4600 W 60th Ave
City/State/Zip: Arvada CO 80003
Phone: 303 433 9788 Fax: 303 433 1432
Sampler Name: USCH SIENEL

Project Manager: BRETT FORKNER
E-Mail: bforkner@LTEWV.com
Project Name: Mutual 7 PAD
Project Number: 065815003.003

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:						Special Instructions
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	ARSENIC	PH	SRM	EL		
B601	3/22/16	1145	2		X			X				X	X	X	X		
B602		1152	2		X			X				X	X	X	X		
B603		1159	2		X			X				X	X	X	X		
B604		1205	2		X			X				X	X	X	X		
Relinquished by: <u>Bok</u> Date/Time: <u>3.22.16 1630</u>				Received by: <u>MA</u> Date/Time: <u>3/22/16 1630</u>				Turn Around Time (Check)				Notes:					
								Same Day <input type="checkbox"/>				72 Hours <input type="checkbox"/>					
								24 Hours <input type="checkbox"/>				Standard <input checked="" type="checkbox"/>					
								48 Hours <input type="checkbox"/>									
Relinquished by: <u>MA</u> Date/Time: <u>3/22/16 1750</u>				Received in Lab by:				Date/Time:				Sample Integrity:					
												Temperature Upon Receipt: <u>4.8°C</u>					
												Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					

www.s2scientific.com

Summit Scientific

M. Clements

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.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

BG01
1603158-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **03/22/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.01	0.123	mg/kg dry	1	1603266	03/25/16	03/28/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **03/22/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	385	11.0	mg/kg dry	1	1603267	03/25/16	03/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	110	5.48	"	"	"	"	"	"	
Sodium	267	5.48	"	"	"	"	"	"	

Date Sampled: **03/22/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	3.09		units	"	1603286	03/29/16	03/29/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.96	0.0100	mmhos/cm	1	1603279	03/28/16	03/28/16	SM 2510B	

Date Sampled: **03/22/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.05	0.100	pH Units	"	1603278	03/28/16	03/28/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Mutual 7 Pad
 Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 03/29/16 14:37

BG01
1603158-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	81.4		%	1	1603240	03/23/16	03/24/16	% calculation	

Summit Scientific

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.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

BG02
1603158-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **03/22/16 11:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.47	0.121	mg/kg dry	1	1603266	03/25/16	03/28/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **03/22/16 11:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	392	12.1	mg/kg dry	1	1603267	03/25/16	03/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	142	6.05	"	"	"	"	"	"	
Sodium	243	6.05	"	"	"	"	"	"	

Date Sampled: **03/22/16 11:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.67		units	"	1603286	03/29/16	03/29/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 11:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	3.99	0.0100	mmhos/cm	1	1603279	03/28/16	03/28/16	SM 2510B	

Date Sampled: **03/22/16 11:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.29	0.100	pH Units	"	1603278	03/28/16	03/28/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Mutual 7 Pad
 Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 03/29/16 14:37

BG02
1603158-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 11:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	82.6		%	1	1603240	03/23/16	03/24/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

BG03
1603158-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **03/22/16 11:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.99	0.129	mg/kg dry	1	1603266	03/25/16	03/28/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **03/22/16 11:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	327	12.9	mg/kg dry	1	1603267	03/25/16	03/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	95.9	6.46	"	"	"	"	"	"	
Sodium	31.1	6.46	"	"	"	"	"	"	

Date Sampled: **03/22/16 11:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.389		units	"	1603286	03/29/16	03/29/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 11:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.431	0.0100	mmhos/cm	1	1603279	03/28/16	03/28/16	SM 2510B	

Date Sampled: **03/22/16 11:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.33	0.100	pH Units	"	1603278	03/28/16	03/28/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Mutual 7 Pad
 Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 03/29/16 14:37

BG03
1603158-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 11:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	77.4		%	1	1603240	03/23/16	03/24/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

BG04
1603158-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **03/22/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.76	0.108	mg/kg dry	1	1603266	03/25/16	03/28/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **03/22/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	373	11.0	mg/kg dry	1	1603267	03/25/16	03/28/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	131	5.48	"	"	"	"	"	"	
Sodium	117	5.48	"	"	"	"	"	"	

Date Sampled: **03/22/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.33		units	"	1603286	03/29/16	03/29/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.615	0.0100	mmhos/cm	1	1603279	03/28/16	03/28/16	SM 2510B	

Date Sampled: **03/22/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.88	0.100	pH Units	"	1603278	03/28/16	03/28/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Mutual 7 Pad
 Project Number: 065815003.003
 Project Manager: Brett Forkner

Reported:
 03/29/16 14:37

BG04
1603158-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/22/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	82.9		%	1	1603240	03/23/16	03/24/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

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 1603266 - EPA 3050B

Blank (1603266-BLK1)

Prepared: 03/25/16 Analyzed: 03/28/16

Arsenic ND 0.100 mg/kg wet

LCS (1603266-BS1)

Prepared: 03/25/16 Analyzed: 03/28/16

Arsenic 43.4 0.100 mg/kg wet 47.6 91.1 59.7-113

Duplicate (1603266-DUP1)

Source: 1603123-03

Prepared: 03/25/16 Analyzed: 03/28/16

Arsenic 8.19 0.131 mg/kg dry 7.66 6.70 20

Matrix Spike (1603266-MS1)

Source: 1603123-03

Prepared: 03/25/16 Analyzed: 03/28/16

Arsenic 59.8 0.131 mg/kg dry 49.6 7.66 105 75-125

Matrix Spike Dup (1603266-MSD1)

Source: 1603123-03

Prepared: 03/25/16 Analyzed: 03/28/16

Arsenic 59.1 0.131 mg/kg dry 49.6 7.66 104 75-125 1.14 25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1603267 - General Preparation

Blank (1603267-BLK1)

Prepared: 03/25/16 Analyzed: 03/28/16

Calcium	ND	10.0	mg/kg wet							
Magnesium	ND	5.00	"							
Sodium	ND	5.00	"							

LCS (1603267-BS1)

Prepared: 03/25/16 Analyzed: 03/28/16

Calcium	525	10.0	mg/kg wet	500	105	82.9-118				
Magnesium	531	5.00	"	500	106	77.1-123				
Sodium	557	5.00	"	500	111	71-129				

Duplicate (1603267-DUP1)

Source: 1603123-03

Prepared: 03/25/16 Analyzed: 03/28/16

Calcium	1100	13.1	mg/kg dry	1020			7.98	200		
Magnesium	114	6.54	"	124			8.56	200		
Sodium	2310	6.54	"	2020			13.3	200		

Matrix Spike (1603267-MS1)

Source: 1603123-03

Prepared: 03/25/16 Analyzed: 03/28/16

Calcium	1930	13.1	mg/kg dry	654	1020	140	75-125			QM-07
Magnesium	833	6.54	"	654	124	108	75-125			
Sodium	2950	6.54	"	654	2020	141	75-125			QM-07

Matrix Spike Dup (1603267-MSD1)

Source: 1603123-03

Prepared: 03/25/16 Analyzed: 03/28/16

Calcium	1880	13.1	mg/kg dry	654	1020	132	75-125	2.77	25	QM-07
Magnesium	856	6.54	"	654	124	112	75-125	2.64	25	
Sodium	2960	6.54	"	654	2020	143	75-125	0.490	25	QM-07

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad
Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

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

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

Batch 1603240 - General Preparation

Duplicate (1603240-DUP1)	Source: 1603147-01			Prepared: 03/23/16 Analyzed: 03/24/16							
% Solids	69.6		%		72.2				3.67	20	

Batch 1603278 - General Preparation

LCS (1603278-BS1)				Prepared & Analyzed: 03/28/16							
pH	8.01	0.100	pH Units	8.00		100	95-105				
Duplicate (1603278-DUP1)	Source: 1603123-03			Prepared & Analyzed: 03/28/16							
pH	9.03	0.100	pH Units		9.02				0.111	20	

Batch 1603279 - General Preparation

Blank (1603279-BLK1)				Prepared & Analyzed: 03/28/16							
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
LCS (1603279-BS1)				Prepared & Analyzed: 03/28/16							
Specific Conductance (EC)	0.489	0.0100	mmhos/cm	0.500		97.8	90-110				
Duplicate (1603279-DUP1)	Source: 1603123-03			Prepared & Analyzed: 03/28/16							
Specific Conductance (EC)	2.71	0.0100	mmhos/cm		2.18				21.6	20	QR-03

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Mutual 7 Pad

Project Number: 065815003.003
Project Manager: Brett Forkner

Reported:
03/29/16 14:37

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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TABLE 1
BACKGROUND SOIL SAMPLING ANALYTICAL RESULTS
GREGORY 5-09H OIL AND GAS LOCATION

SANDRIDGE ENERGY, INC.

Parameter	COGCC Table 910-1 Concentration Levels	Units	BG01	BG02	BG03	BG04
Sample Date			1/18/2016	1/18/2016	1/18/2016	1/18/2016
Sample Type			Background	Background	Background	Background
Depth (feet bgs)			0-0.75	0-0.75	0-0.75	0-0.75
Benzene	0.17	mg/kg	--	--	--	--
Toluene	85	mg/kg	--	--	--	--
Ethylbenzene	100	mg/kg	--	--	--	--
Total Xylenes	175	mg/kg	--	--	--	--
TEPH-DRO	--	mg/kg	--	--	--	--
TVPH-GRO	--	mg/kg	--	--	--	--
TPH Total	500	mg/kg	--	--	--	--
Arsenic	0.39	mg/kg	4.04	6.09	1.91	1.87
Barium	15,000	mg/kg	--	--	--	--
Cadmium	70	mg/kg	--	--	--	--
Chromium (III)	120,000	mg/kg	--	--	--	--
Chromium (VI)	23	mg/kg	--	--	--	--
Copper	3,100	mg/kg	--	--	--	--
Lead	400	mg/kg	--	--	--	--
Mercury	23	mg/kg	--	--	--	--
Nickel	1,600	mg/kg	--	--	--	--
Selenium	390	mg/kg	--	--	--	--
Silver	390	mg/kg	--	--	--	--
Zinc	23,000	mg/kg	--	--	--	--
Acenaphthene	1,000	mg/kg	--	--	--	--
Anthracene	1,000	mg/kg	--	--	--	--
Benzo (A) anthracene	0.22	mg/kg	--	--	--	--
Benzo (B) fluoranthene	0.22	mg/kg	--	--	--	--
Benzo (K) fluoranthene	2.2	mg/kg	--	--	--	--
Benzo (A) pyrene	0.022	mg/kg	--	--	--	--
Chrysene	22	mg/kg	--	--	--	--
Dibenzo (A,H) anthracene	0.022	mg/kg	--	--	--	--
Fluoranthene	1,000	mg/kg	--	--	--	--
Fluorene	1,000	mg/kg	--	--	--	--
Indeno (1,2,3,C,D) pyrene	0.22	mg/kg	--	--	--	--
Naphthalene	23	mg/kg	--	--	--	--
Pyrene	1,000	mg/kg	--	--	--	--
EC	4	mmhos/cm	0.259	1.55	0.639	0.278
pH	6 - 9	SU	6.05	7.01	7.06	6.81
SAR	12	unitless	0.215	0.308	1.89	1.52

NOTES:

BOLD - indicates result exceeds the COGCC Table 910-1 Concentration Level

bgs - below ground surface

COGCC - colorado oil and gas conservation commission

EC - electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter in saturated paste extract

SAR - sodium adsorption ratio

SU - standard unit on saturated paste

TEPH-DRO - total extractable petroleum hydrocarbon-diesel range organics

TVPH-GRO - total volume petroleum hydrocarbon-gasolene range organics

TPH - total petroleum hydrocarbons

-- - not analyzed/no standard

< - less than the stated analytical reporting limit



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

January 24, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: Gregory 5-09H

Enclosed are the results of analyses for samples received by Summit Scientific on 01/19/16 09:23. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG01	1601145-01	Soil	01/18/16 12:10	01/19/16 09:23
BG02	1601145-02	Soil	01/18/16 12:15	01/19/16 09:23
BG03	1601145-03	Soil	01/18/16 12:20	01/19/16 09:23
BG04	1601145-04	Soil	01/18/16 12:25	01/19/16 09:23

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

Summit Scientific

S₂

741 Corporate Circle Suite J ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-277-9531 Fax

1601145

Page 1 of 1

Client: LT Environmental, Inc.

Address: 4600 West 60th Avenue

Project Manager: Brett Forkner

City/State/Zip: Arvada, CO 80003

E-Mail: bForkner@Ltenv.com

Phone: (303) 433-9788

Fax: (303) 433-1432

Project Name: Gregory 5-09H

Sampler Name: G Muniz

Project Number: 065815003

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	As ₂ S ₃	SAE	EC		Pt
BG01	1/18/16	1210	1			/		/				/	/	/		
BG02	↓	1215	1			/		/				/	/	/		
BG03	↓	1220	1			/		/				/	/	/		
BG04	↓	1225	1			/		/				/	/	/		
Relinquished by: <i>[Signature]</i> Date/Time: 1/19/16 0923				Received by: <i>[Signature]</i> Date/Time: 1/19/16 1:23				Turn Around Time (Check)				Notes:				
Relinquished by: <i>[Signature]</i> Date/Time: 1/19/16 9:50				Received by: <i>[Signature]</i> Date/Time: 1/19/16 9:50				Same Day <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/>				on KP				
Relinquished by: <i>[Signature]</i> Date/Time: 1/19/16 9:50				Received in Lab by: <i>[Signature]</i> Date/Time: 1/19/16 9:50				24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/>				Sample Integrity: Temperature Upon Receipt: 6.6°C				
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								

www.s2scientific.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

BG01
1601145-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **01/18/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	4.04	0.0945	mg/kg dry	1	1601205	01/21/16	01/21/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **01/18/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	38.4	10.8	mg/kg dry	1	1601206	01/21/16	01/21/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	15.3	5.41	"	"	"	"	"	"	
Sodium	6.24	5.41	"	"	"	"	"	"	

Date Sampled: **01/18/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.215		units	"	1601219	01/22/16	01/22/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.259	0.0100	mmhos/cm	1	1601194	01/20/16	01/20/16	SM 2510B	

Date Sampled: **01/18/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.05	0.100	pH Units	"	1601193	01/20/16	01/20/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
 Project Manager: Brett Forkner

Reported:
 01/24/16 15:16

BG01

1601145-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	92.5		%	1	1601195	01/20/16	01/21/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

BG02
1601145-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **01/18/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	6.09	0.182	mg/kg dry	1	1601205	01/21/16	01/21/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **01/18/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	492	16.9	mg/kg dry	1	1601206	01/21/16	01/21/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	198	8.46	"	"	"	"	"	"	
Sodium	32.0	8.46	"	"	"	"	"	"	

Date Sampled: **01/18/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.308		units	"	1601219	01/22/16	01/22/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.55	0.0100	mmhos/cm	1	1601194	01/20/16	01/20/16	SM 2510B	

Date Sampled: **01/18/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.01	0.100	pH Units	"	1601193	01/20/16	01/20/16	EPA 9045	

Summit Scientific

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.



LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
 Project Manager: Brett Forkner

Reported:
 01/24/16 15:16

BG02

1601145-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	47.3		%	1	1601195	01/20/16	01/21/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H
Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

BG03
1601145-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **01/18/16 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.91	0.120	mg/kg dry	1	1601205	01/21/16	01/21/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **01/18/16 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	78.7	12.0	mg/kg dry	1	1601206	01/21/16	01/21/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	20.3	6.02	"	"	"	"	"	"	
Sodium	72.6	6.02	"	"	"	"	"	"	

Date Sampled: **01/18/16 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.89		units	"	1601219	01/22/16	01/22/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.639	0.0100	mmhos/cm	1	1601194	01/20/16	01/20/16	SM 2510B	

Date Sampled: **01/18/16 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.06	0.100	pH Units	"	1601193	01/20/16	01/20/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
 Project Manager: Brett Forkner

Reported:
 01/24/16 15:16

BG03

1601145-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	83.0		%	1	1601195	01/20/16	01/21/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

BG04
1601145-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **01/18/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.87	0.111	mg/kg dry	1	1601205	01/21/16	01/21/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **01/18/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	59.6	8.97	mg/kg dry	1	1601206	01/21/16	01/21/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	15.1	4.48	"	"	"	"	"	"	
Sodium	50.7	4.48	"	"	"	"	"	"	

Date Sampled: **01/18/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.52		units	"	1601219	01/22/16	01/22/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.278	0.0100	mmhos/cm	1	1601194	01/20/16	01/20/16	SM 2510B	

Date Sampled: **01/18/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.81	0.100	pH Units	"	1601193	01/20/16	01/20/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
 Project Manager: Brett Forkner

Reported:
 01/24/16 15:16

BG04
1601145-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/18/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	90.1		%	1	1601195	01/20/16	01/21/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Gregory 5-09H
 Project Number: 065815003
 Project Manager: Brett Forkner

Reported:
 01/24/16 15:16

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 1601205 - EPA 3050B

Blank (1601205-BLK1)			Prepared & Analyzed: 01/21/16							
Arsenic	0.367	0.125	mg/kg wet							
LCS (1601205-BS1)			Prepared & Analyzed: 01/21/16							
Arsenic	284	0.250	mg/kg wet	316		89.7	59-110			
Duplicate (1601205-DUP1)			Source: 1601144-01		Prepared & Analyzed: 01/21/16					
Arsenic	3.11	0.136	mg/kg dry		4.44			35.0	20	QR-03
Matrix Spike (1601205-MS1)			Source: 1601144-01		Prepared & Analyzed: 01/21/16					
Arsenic	56.1	0.122	mg/kg dry	48.6	4.44	106	75-125			
Matrix Spike Dup (1601205-MSD1)			Source: 1601144-01		Prepared & Analyzed: 01/21/16					
Arsenic	60.6	0.136	mg/kg dry	52.3	4.44	107	75-125	7.68	25	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1601206 - General Preparation

Blank (1601206-BLK1)

Prepared & Analyzed: 01/21/16

Calcium	ND	10.0	mg/kg wet						
Magnesium	ND	5.00	"						
Sodium	ND	5.00	"						

LCS (1601206-BS1)

Prepared & Analyzed: 01/21/16

Calcium	565	10.0	mg/kg wet	500	113	82.9-118			
Magnesium	538	5.00	"	500	108	77.1-123			
Sodium	549	5.00	"	500	110	71-129			

Duplicate (1601206-DUP1)

Source: 1601145-01

Prepared & Analyzed: 01/21/16

Calcium	44.1	10.8	mg/kg dry	38.4			13.9	200	
Magnesium	16.5	5.41	"	15.3			7.87	200	
Sodium	4.33	5.41	"	6.24			36.1	200	

Matrix Spike (1601206-MS1)

Source: 1601145-01

Prepared & Analyzed: 01/21/16

Calcium	660	10.8	mg/kg dry	536	38.4	116	75-125		
Magnesium	594	5.41	"	536	15.3	108	75-125		
Sodium	573	5.41	"	536	6.24	106	75-125		

Matrix Spike Dup (1601206-MSD1)

Source: 1601145-01

Prepared & Analyzed: 01/21/16

Calcium	678	10.8	mg/kg dry	536	38.4	119	75-125	2.70	25
Magnesium	629	5.41	"	536	15.3	115	75-125	5.72	25
Sodium	603	5.41	"	536	6.24	111	75-125	5.13	25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H
Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

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

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

Batch 1601193 - General Preparation

LCS (1601193-BS1)					Prepared & Analyzed: 01/20/16					
pH	7.96	0.100	pH Units	8.00	99.5	95-105				
Duplicate (1601193-DUP1)					Source: 1601051-04 Prepared & Analyzed: 01/20/16					
pH	8.92	0.100	pH Units	9.11	2.11	20				

Batch 1601194 - General Preparation

Blank (1601194-BLK1)					Prepared & Analyzed: 01/20/16					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1601194-BS1)					Prepared & Analyzed: 01/20/16					
Specific Conductance (EC)	0.504	0.0100	mmhos/cm	0.500	101	90-110				
Duplicate (1601194-DUP1)					Source: 1601051-04 Prepared & Analyzed: 01/20/16					
Specific Conductance (EC)	2.80	0.0100	mmhos/cm	2.24	22.1	20	QR-03			

Batch 1601195 - General Preparation

Duplicate (1601195-DUP1)					Source: 1601144-01 Prepared: 01/20/16 Analyzed: 01/21/16					
% Solids	71.8		%	73.5	2.34	20				

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Gregory 5-09H

Project Number: 065815003
Project Manager: Brett Forkner

Reported:
01/24/16 15:16

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.
- 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

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.

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

September 22, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003

RE: Open Range Background Samples

Enclosed are the results of analyses for samples received by Summit Scientific on 09/16/16 16:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OR BG01 N	1609098-01	Soil	09/14/16 16:00	09/16/16 16:25
OR BG02 E	1609098-02	Soil	09/14/16 16:00	09/16/16 16:25
OR BG03 S	1609098-03	Soil	09/14/16 16:00	09/16/16 16:25
OR BG04 W	1609098-04	Soil	09/14/16 16:00	09/16/16 16:25

Summit Scientific

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.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

Summit Scientific

S₂

1609098

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

Client: LTE Project Manager: BRETT FORKNER Page 1 of 1
Address: 4600 W 60th Ave E-Mail: BFORKNER@LTENV.COM
City/State/Zip: ARVADA CO 80003
Phone: 303 433 9787 Fax: Project Name: OPEN RANGE BACKGROUND SAMPLES
Sampler Name: MICHAEL JAMES Project Number: 065815003.0003

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested					Special Instructions
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	Asst. GZ	PH	EL	SAR	
1	OR B601 N	9/14/16	1600	2			X						X	X	X	X	
2	OR B602 E			2			X			X			X	X	X	X	
3	OR B603 S			2			X			X			X				
4	OR B604 W			2			X			X			X				
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished by: <u>[Signature]</u>	Date/Time: <u>9/16 1200</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9/16/16 1200</u>	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 hours <input type="checkbox"/> Sample Integrity: Temperature Upon Receipt: <u>0.7°C</u> Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Notes: <u>on ice</u>
Relinquished by: <u>[Signature]</u>	Date/Time: <u>9/16/16 1625</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9/16/16 1625</u>		
Relinquished by: <u>[Signature]</u>	Date/Time: <u>9/16/16 1730</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9-16 1730</u>		

www.s2scientific.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

Sample Receipt Checklist

S2 Work Order: 1609098

Client: LTE Client Project ID: Open Range Background Sample

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

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

Cooler ID					
Temp (°C)	<u>0.7</u>				

Thermometer ID: 61857155-K

	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, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<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):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

9/16/16 1730
Date/Time

[Signature]



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

OR BG01 N
1609098-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 09/14/16 16:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.76	0.212	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 09/14/16 16:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	141	8.54	mg/kg dry	1	1609138	09/19/16	09/19/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	80.2	4.27	"	"	"	"	"	"	
Sodium	121	4.27	"	"	"	"	"	"	

Date Sampled: 09/14/16 16:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.02		units	"	1609143	09/20/16	09/20/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 09/14/16 16:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.374	0.0100	mmhos/cm	1	1609132	09/19/16	09/19/16	SM 2510B	

Date Sampled: 09/14/16 16:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.53	0.100	pH Units	"	1609127	09/19/16	09/19/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 09:12

OR BG01 N
1609098-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	94.4		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 09:12

OR BG02 E
1609098-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.46	0.227	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	88.0		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 09:12

OR BG03 S
1609098-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	3.16	0.229	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.3		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 09:12

OR BG04 W
1609098-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.68	0.237	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	84.3		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

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

Summit Scientific

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

Batch 1609122 - EPA 3050B

Blank (1609122-BLK1)

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic ND 0.200 mg/kg wet

LCS (1609122-BS1)

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 133 0.500 mg/kg wet 132 101 82.6-117

Duplicate (1609122-DUP1)

Source: 1609080-04

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 10.5 0.231 mg/kg dry 10.4 0.946 20

Matrix Spike (1609122-MS1)

Source: 1609080-04

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 73.0 0.231 mg/kg dry 45.6 10.4 137 75-125 QM-07

Matrix Spike Dup (1609122-MSD1)

Source: 1609080-04

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 64.1 0.231 mg/kg dry 45.6 10.4 118 75-125 13.0 25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples
Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1609138 - General Preparation

Blank (1609138-BLK1)

Prepared & Analyzed: 09/19/16

Calcium	ND	10.0	mg/kg wet					
Magnesium	ND	5.00	"					
Sodium	ND	5.00	"					

LCS (1609138-BS1)

Prepared & Analyzed: 09/19/16

Calcium	541	10.0	mg/kg wet	500	108	82.9-118		
Magnesium	532	5.00	"	500	106	77.1-123		
Sodium	525	5.00	"	500	105	71-129		

Duplicate (1609138-DUP1)

Source: 1609098-01

Prepared & Analyzed: 09/19/16

Calcium	121	8.54	mg/kg dry	141			15.2	200
Magnesium	72.5	4.27	"	80.2			10.1	200
Sodium	104	4.27	"	121			15.0	200

Matrix Spike (1609138-MS1)

Source: 1609098-01

Prepared & Analyzed: 09/19/16

Calcium	555	8.54	mg/kg dry	427	141	96.9	75-125	
Magnesium	531	4.27	"	427	80.2	106	75-125	
Sodium	556	4.27	"	427	121	102	75-125	

Matrix Spike Dup (1609138-MSD1)

Source: 1609098-01

Prepared & Analyzed: 09/19/16

Calcium	600	8.54	mg/kg dry	427	141	107	75-125	7.76	25
Magnesium	560	4.27	"	427	80.2	112	75-125	5.25	25
Sodium	570	4.27	"	427	121	105	75-125	2.62	25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples
Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

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

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

Batch 1609127 - General Preparation

LCS (1609127-BS1)					Prepared & Analyzed: 09/19/16					
pH	6.02	0.100	pH Units	6.00	100	95-105				
Duplicate (1609127-DUP1)					Source: 1609098-01		Prepared & Analyzed: 09/19/16			
pH	7.50	0.100	pH Units	7.53	0.399	20				

Batch 1609132 - General Preparation

Blank (1609132-BLK1)					Prepared & Analyzed: 09/19/16					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1609132-BS1)					Prepared & Analyzed: 09/19/16					
Specific Conductance (EC)	0.502	0.0100	mmhos/cm	0.500	100	90-110				
Duplicate (1609132-DUP1)					Source: 1609098-01		Prepared & Analyzed: 09/19/16			
Specific Conductance (EC)	0.330	0.0100	mmhos/cm	0.374	12.7	20				

Batch 1609135 - General Preparation

Duplicate (1609135-DUP1)					Source: 1609098-01		Prepared: 09/19/16 Analyzed: 09/20/16			
% Solids	94.4		%	94.4	0.0273	20				

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Open Range Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 09:12

Notes and Definitions

- 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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Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

September 22, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003

RE: Ray Ranch West Background Samples

Enclosed are the results of analyses for samples received by Summit Scientific on 09/16/16 16:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RRW BG01 N	1609099-01	Soil	09/14/16 14:00	09/16/16 16:25
RRW BG02 E	1609099-02	Soil	09/14/16 14:00	09/16/16 16:25
RRW BG03 S	1609099-03	Soil	09/14/16 14:00	09/16/16 16:25
RRW BG04 W	1609099-04	Soil	09/14/16 14:00	09/16/16 16:25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

Summit Scientific

S₂

1609 099

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

Page 1 of 1

Client: LTE Project Manager: BRETT FORKNER
Address: 4600 W 60TH AVE E-Mail: BRETT@S2SCIENTIFIC.COM
City/State/Zip: ARVADA CO 80003
Phone: 303 433 9753 Fax: Project Name: RAY RANCH WEST BACKGROUND SAMPLES
Sampler Name: MICHAEL SOMES Project Number: 065815003.0003

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested				Special Instructions
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	APACHE	PH	EC	
1	RAW B601 N	9/14/16	1400	2			X			X			X	X	X	
2	RAW B602 E						X			X			X	X	X	
3	RAW B603 S						X			X			X	X	X	
4	RAW B604 W						X			X			X	X	X	
5																
6																
7																
8																
9																
10																
Relinquished by: <u>[Signature]</u>		Date/Time: <u>9/16 1250</u>	Received by: <u>[Signature]</u>		Date/Time: <u>9/16/16 1200</u>	Turn Around Time (Check)		Notes:								
						Same Day	72 hours	on ice								
						24 hours	Standard									
						48 hours										
Relinquished by: <u>[Signature]</u>		Date/Time: <u>9/16/16 1625</u>	Received by: <u>[Signature]</u>		Date/Time: <u>9/16/16 1625</u>	Sample Integrity:										
						Temperature Upon Receipt: <u>0.7°C</u>										
Relinquished by: <u>[Signature]</u>		Date/Time: <u>9/16/16 1730</u>	Received by: <u>[Signature]</u>		Date/Time: <u>9-16-16 1730</u>	Intact: <u>Yes</u> No										

www.s2scientific.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

Sample Receipt Checklist

S2 Work Order: 1609099

Client: LTE

Client Project ID: Ray Ranch West Background Samples

Shipped Via: P/V

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	<u>0.7</u>				

Thermometer ID: 61857155-K

	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⁾ ?				
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?				
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, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<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):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

9/16/16 1730
Date/Time

[Signature]



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

RRW BG01 N
1609099-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.235	0.214	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	156	10.7	mg/kg dry	1	1609138	09/19/16	09/20/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	80.8	5.35	"	"	"	"	"	"	
Sodium	52.7	5.35	"	"	"	"	"	"	

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.853		units	"	1609143	09/20/16	09/20/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.224	0.0100	mmhos/cm	1	1609132	09/19/16	09/19/16	SM 2510B	

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.36	0.100	pH Units	"	1609127	09/19/16	09/19/16	EPA 9045	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 13:58

RRW BG01 N
1609099-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	93.5		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 13:58

RRW BG02 E
1609099-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.354	0.206	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	97.0		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 13:58

RRW BG03 S
1609099-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.534	0.209	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	95.6		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
 Project Manager: Brett Forkner

Reported:
 09/22/16 13:58

RRW BG04 W
1609099-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.677	0.209	mg/kg dry	1	1609122	09/16/16	09/19/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **09/14/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	95.6		%	1	1609135	09/19/16	09/20/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples
Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

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 1609122 - EPA 3050B

Blank (1609122-BLK1)

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic ND 0.200 mg/kg wet

LCS (1609122-BS1)

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 133 0.500 mg/kg wet 132 101 82.6-117

Duplicate (1609122-DUP1)

Source: 1609080-04

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 10.5 0.231 mg/kg dry 10.4 0.946 20

Matrix Spike (1609122-MS1)

Source: 1609080-04

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 73.0 0.231 mg/kg dry 45.6 10.4 137 75-125 QM-07

Matrix Spike Dup (1609122-MSD1)

Source: 1609080-04

Prepared: 09/16/16 Analyzed: 09/19/16

Arsenic 64.1 0.231 mg/kg dry 45.6 10.4 118 75-125 13.0 25

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples
Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1609138 - General Preparation

Blank (1609138-BLK1)

Prepared & Analyzed: 09/19/16

Calcium	ND	10.0	mg/kg wet						
Magnesium	ND	5.00	"						
Sodium	ND	5.00	"						

LCS (1609138-BS1)

Prepared & Analyzed: 09/19/16

Calcium	541	10.0	mg/kg wet	500	108	82.9-118			
Magnesium	532	5.00	"	500	106	77.1-123			
Sodium	525	5.00	"	500	105	71-129			

Duplicate (1609138-DUP1)

Source: 1609098-01

Prepared & Analyzed: 09/19/16

Calcium	121	8.54	mg/kg dry	141			15.2	200	
Magnesium	72.5	4.27	"	80.2			10.1	200	
Sodium	104	4.27	"	121			15.0	200	

Matrix Spike (1609138-MS1)

Source: 1609098-01

Prepared & Analyzed: 09/19/16

Calcium	555	8.54	mg/kg dry	427	141	96.9	75-125		
Magnesium	531	4.27	"	427	80.2	106	75-125		
Sodium	556	4.27	"	427	121	102	75-125		

Matrix Spike Dup (1609138-MSD1)

Source: 1609098-01

Prepared & Analyzed: 09/19/16

Calcium	600	8.54	mg/kg dry	427	141	107	75-125	7.76	25
Magnesium	560	4.27	"	427	80.2	112	75-125	5.25	25
Sodium	570	4.27	"	427	121	105	75-125	2.62	25

Summit Scientific

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4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples
Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

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

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

Batch 1609127 - General Preparation

LCS (1609127-BS1)			Prepared & Analyzed: 09/19/16						
pH	6.02	0.100	pH Units	6.00	100	95-105			
Duplicate (1609127-DUP1)			Source: 1609098-01		Prepared & Analyzed: 09/19/16				
pH	7.50	0.100	pH Units	7.53			0.399	20	

Batch 1609132 - General Preparation

Blank (1609132-BLK1)			Prepared & Analyzed: 09/19/16						
Specific Conductance (EC)	ND	0.0100	mmhos/cm						
LCS (1609132-BS1)			Prepared & Analyzed: 09/19/16						
Specific Conductance (EC)	0.502	0.0100	mmhos/cm	0.500	100	90-110			
Duplicate (1609132-DUP1)			Source: 1609098-01		Prepared & Analyzed: 09/19/16				
Specific Conductance (EC)	0.330	0.0100	mmhos/cm	0.374			12.7	20	

Batch 1609135 - General Preparation

Duplicate (1609135-DUP1)			Source: 1609098-01		Prepared: 09/19/16 Analyzed: 09/20/16				
% Solids	94.4		%	94.4			0.0273	20	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Ray Ranch West Background Samples

Project Number: 065815003.0003
Project Manager: Brett Forkner

Reported:
09/22/16 13:58

Notes and Definitions

- 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

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.

TABLE 1
BACKGROUND SOIL SAMPLING ANALYTICAL RESULTS
EVANS 2-21H & RAY RANCH 7-21h OIL AND GAS LOCATION
SANDRIDGE ENERGY, INC.

Parameter	COGCC Table 910-1 Concentration Levels	Units	BG01	BG02	BG03	BG04
Sample Date			5/4/2016	5/4/2016	5/4/2016	5/4/2016
Sample Type			Background	Background	Background	Background
Depth (feet bgs)			0-0.5	0-0.5	0-0.5	0-0.5
Benzene	0.17	mg/kg	--	--	--	--
Toluene	85	mg/kg	--	--	--	--
Ethylbenzene	100	mg/kg	--	--	--	--
Total Xylenes	175	mg/kg	--	--	--	--
TEPH-DRO	--	mg/kg	--	--	--	--
TVPH-GRO	--	mg/kg	--	--	--	--
TPH Total	500	mg/kg	--	--	--	--
Arsenic	0.39	mg/kg	2.44	2.97	2.97	2.61
Barium	15,000	mg/kg	--	--	--	--
Cadmium	70	mg/kg	--	--	--	--
Chromium (III)	120,000	mg/kg	--	--	--	--
Chromium (VI)	23	mg/kg	--	--	--	--
Copper	3,100	mg/kg	--	--	--	--
Lead	400	mg/kg	--	--	--	--
Mercury	23	mg/kg	--	--	--	--
Nickel	1,600	mg/kg	--	--	--	--
Selenium	390	mg/kg	--	--	--	--
Silver	390	mg/kg	--	--	--	--
Zinc	23,000	mg/kg	--	--	--	--
Acenaphthene	1,000	mg/kg	--	--	--	--
Anthracene	1,000	mg/kg	--	--	--	--
Benzo (A) anthracene	0.22	mg/kg	--	--	--	--
Benzo (B) fluoranthene	0.22	mg/kg	--	--	--	--
Benzo (K) fluoranthene	2.2	mg/kg	--	--	--	--
Benzo (A) pyrene	0.022	mg/kg	--	--	--	--
Chrysene	22	mg/kg	--	--	--	--
Dibenzo (A,H) anthracene	0.022	mg/kg	--	--	--	--
Fluoranthene	1,000	mg/kg	--	--	--	--
Fluorene	1,000	mg/kg	--	--	--	--
Indeno (1,2,3,C,D) pyrene	0.22	mg/kg	--	--	--	--
Napthalene	23	mg/kg	--	--	--	--
Pyrene	1,000	mg/kg	--	--	--	--
EC	4	mmhos/cm	--	--	--	0.349
pH	6 - 9	SU	--	--	--	8.16
SAR	12	unitless	--	--	--	0.341

NOTES:

BOLD - indicates result exceeds the COGCC Table 910-1 Concentration Level

bgs - below ground surface

COGCC - colorado oil and gas conservation commission

EC - electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter in saturated paste extract

SAR - sodium adsorption ratio

SU - standard unit on saturated paste

TEPH-DRO - total extractable petroleum hydrocarbon-diesel range organics

TVPH-GRO - total volume petroleum hydrocarbon-gasolene range organics

TPH - total petroleum hydrocarbons

-- - not analyzed/no standard

< - less than the stated analytical reporting limit



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 13, 2016

Gentry Muniz

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: Evans 2-21H, Ray Ranch 7-21H

Enclosed are the results of analyses for samples received by Summit Scientific on 05/05/16 16:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG01	1605049-01	Soil	05/04/16 11:20	05/05/16 16:15
BG02	1605049-02	Soil	05/04/16 11:30	05/05/16 16:15
BG03	1605049-03	Soil	05/04/16 11:40	05/05/16 16:15
BG04	1605049-04	Soil	05/04/16 11:50	05/05/16 16:15

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
 Project Manager: Gentry Muniz

Reported:
 05/13/16 06:51

1605049

Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401
 303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: LT Environmental Inc
 Address: 4100 W 60th Ave
 City/State/Zip: Arvada, CO 80003
 Phone: 303-433-4789 Fax:
 Sampler Name: DS

Project Manager: Gentry Muniz
 E-Mail: gmuniz@ltenv.com, gtmuniz@ltenv.com
 Project Name: Evans 2-21H, Ray Ranch 7-21H
 Project Number: 06581002

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	Asenic	pH	SAR		EC
B601	5/4/16	1120	1		X							X				
B602	5/4/16	1130	1		X			X				X				
B603	5/4/16	1140	1		X			X				X				
B604	5/4/16	1150	1		X			X				X	X	X	X	
Relinquished by: <u>Drew Stormo</u>		Date/Time: <u>5/5/16 1015</u>		Received by: <u>ML</u>		Date/Time: <u>5/5/16 165</u>		Turn Around Time (Check)				Notes:				
								Same Day <input type="checkbox"/>				72 Hours <input type="checkbox"/>				
								24 Hours <input type="checkbox"/>				Standard <input checked="" type="checkbox"/>				
								48 Hours <input type="checkbox"/>								
Relinquished by: <u>ML</u>		Date/Time: <u>5/5/16 1700</u>		Received in Lab by:		Date/Time:		Sample Integrity:				Temperature Upon Receipt: <u>15.4°C</u>				
								Intact: (Yes) <input checked="" type="checkbox"/> No <input type="checkbox"/>				on ice				

www.s2scientific.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

Sample Receipt Checklist

S2 Work Order: 1605049

Client: LT Env.

Client Project ID: Evans 2-21H, Ray Ranch 7-21H

Shipped Via: pick up

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)		<u>5.4° C</u>			

Thermometer ID: 61857155-K

	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, HNO3, ect				
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.				

Nakita
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

5/13/16 12:00
Date/Time



LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
 Project Manager: Gentry Muniz

Reported:
 05/13/16 06:51

BG01
1605049-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/04/16 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.44	0.116	mg/kg dry	1	1605071	05/09/16	05/09/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/16 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	86.0		%	1	1605074	05/09/16	05/09/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
 Project Manager: Gentry Muniz

Reported:
 05/13/16 06:51

BG02
1605049-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/04/16 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.97	0.135	mg/kg dry	1	1605071	05/09/16	05/09/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/16 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	74.1		%	1	1605074	05/09/16	05/09/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
 Project Manager: Gentry Muniz

Reported:
 05/13/16 06:51

BG03
1605049-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/04/16 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.97	0.138	mg/kg dry	1	1605071	05/09/16	05/09/16	EPA 6020A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/16 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	72.6		%	1	1605074	05/09/16	05/09/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

BG04
1605049-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: **05/04/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.61	0.134	mg/kg dry	1	1605071	05/09/16	05/09/16	EPA 6020A	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **05/04/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1030	13.4	mg/kg dry	1	1605094	05/10/16	05/11/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	239	6.70	"	"	"	"	"	"	
Sodium	46.7	6.70	"	"	"	"	"	"	

Date Sampled: **05/04/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.341		units	"	1605123	05/12/16	05/12/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.349	0.0100	mmhos/cm	1	1605066	05/06/16	05/06/16	SM 2510B	

Date Sampled: **05/04/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.16	0.100	pH Units	"	1605065	05/06/16	05/06/16	EPA 9045	

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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
 Project Manager: Gentry Muniz

Reported:
 05/13/16 06:51

BG04
1605049-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **05/04/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	74.6		%	1	1605074	05/09/16	05/09/16	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

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 1605071 - EPA 3050B

Blank (1605071-BLK1)

Prepared & Analyzed: 05/09/16

Arsenic ND 0.100 mg/kg wet

LCS (1605071-BS1)

Prepared & Analyzed: 05/09/16

Arsenic 39.7 0.100 mg/kg wet 40.0 99.2 59.7-113

Duplicate (1605071-DUP1)

Source: 1605060-01

Prepared & Analyzed: 05/09/16

Arsenic 2.91 0.120 mg/kg dry 3.05 4.62 20

Matrix Spike (1605071-MS1)

Source: 1605060-01

Prepared & Analyzed: 05/09/16

Arsenic 10.7 0.120 mg/kg dry 48.1 3.05 16.0 75-125 QM-07

Matrix Spike Dup (1605071-MSD1)

Source: 1605060-01

Prepared & Analyzed: 05/09/16

Arsenic 10.6 0.120 mg/kg dry 48.1 3.05 15.7 75-125 1.24 25 QM-07

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1605094 - General Preparation

Blank (1605094-BLK1)

Prepared: 05/10/16 Analyzed: 05/11/16

Calcium	ND	10.0	mg/kg wet						
Magnesium	ND	5.00	"						
Sodium	ND	5.00	"						

LCS (1605094-BS1)

Prepared: 05/10/16 Analyzed: 05/11/16

Calcium	564	10.0	mg/kg wet	500	113	82.9-118			
Magnesium	529	5.00	"	500	106	77.1-123			
Sodium	538	5.00	"	500	108	71-129			

Duplicate (1605094-DUP1)

Source: 1605049-04

Prepared: 05/10/16 Analyzed: 05/11/16

Calcium	990	13.4	mg/kg dry	1030			3.48	200	
Magnesium	222	6.70	"	239			7.43	200	
Sodium	35.4	6.70	"	46.7			27.4	200	

Matrix Spike (1605094-MS1)

Source: 1605049-04

Prepared: 05/10/16 Analyzed: 05/11/16

Calcium	1550	13.4	mg/kg dry	621	1030	84.2	75-125		
Magnesium	855	6.70	"	621	239	99.3	75-125		
Sodium	703	6.70	"	621	46.7	106	75-125		

Matrix Spike Dup (1605094-MSD1)

Source: 1605049-04

Prepared: 05/10/16 Analyzed: 05/11/16

Calcium	1580	13.4	mg/kg dry	621	1030	89.8	75-125	2.22	25
Magnesium	886	6.70	"	621	239	104	75-125	3.59	25
Sodium	707	6.70	"	621	46.7	106	75-125	0.448	25

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

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

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

Batch 1605065 - General Preparation

LCS (1605065-BS1)					Prepared & Analyzed: 05/06/16					
pH	8.01	0.100	pH Units	8.00	100	95-105				
Duplicate (1605065-DUP1)					Source: 1605053-01 Prepared & Analyzed: 05/06/16					
pH	8.25	0.100	pH Units	8.24				0.121	20	

Batch 1605066 - General Preparation

Blank (1605066-BLK1)					Prepared & Analyzed: 05/06/16					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1605066-BS1)					Prepared & Analyzed: 05/06/16					
Specific Conductance (EC)	0.496	0.0100	mmhos/cm	0.500	99.2	90-110				
Duplicate (1605066-DUP1)					Source: 1605053-01 Prepared & Analyzed: 05/06/16					
Specific Conductance (EC)	0.806	0.0100	mmhos/cm	0.887				9.57	20	

Batch 1605074 - General Preparation

Duplicate (1605074-DUP1)					Source: 1605060-01 Prepared & Analyzed: 05/09/16					
% Solids	93.4		%	83.2				11.6	20	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Evans 2-21H, Ray Ranch 7-21H

Project Number: 06581002
Project Manager: Gentry Muniz

Reported:
05/13/16 06:51

Notes and Definitions

- 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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