

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109



FOR OGCC USE ONLY

#8360

Received  
3/26/2014

## SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

☒ Spill ☐ Complaint  
☐ Inspection ☐ NOAV

Tracking No: 2147685

## CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): No Further Action Request

## GENERAL INFORMATION

<b>OGCC Operator Number:</b> 8960		<b>Contact Name and Telephone</b>	
<b>Name of Operator:</b> Bonanza Creek Energy Operating Company LLC		<b>Name:</b> Brian Dodek	
<b>Address:</b> 410 17th Street, Suite 1400		<b>No:</b> 720-225-6653	
<b>City:</b> Denver <b>State:</b> CO <b>Zip:</b> 80202		<b>Fax:</b> 720-279-2331	
<b>API/Facility No:</b> 05-123-37095		<b>County:</b> Weld	
<b>Facility Name:</b> State North Platte F-26 Pad		<b>Facility Number:</b> 432395	
<b>Well Name:</b> State North Platte		<b>Well Number:</b> F-J-26HC	
<b>Location (QtrQtr, Sec, Twp, Rng, Meridian):</b> NWNW 26-T5N-R63W		<b>Latitude:</b> 40.37613 <b>Longitude:</b> -104.40901	

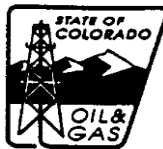
## TECHNICAL CONDITIONS

<b>Type of Waste Causing Impact</b> (crude oil, condensate, produced water, etc.): Flowback Water	
<b>Site Conditions:</b> Is location within a sensitive area (according to Rule 901e)? Y <input type="checkbox"/> N <input checked="" type="checkbox"/> If yes, attach evaluation.	
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland	
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Osgood Sand	
Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water and wetlands are greater than one mile from the site.	
A water well (domestic) and building are located approximately 2,350 feet north of the site.	
<b>Description of Impact</b> (if previously provided, refer to that form or document):	
<b>Impacted Media</b> (check):	<b>Extent of Impact:</b>
<input checked="" type="checkbox"/> Soils	10' N-S x 10' E-W x 1" bgs
<input type="checkbox"/> Vegetation	
<input type="checkbox"/> Groundwater	Not encountered
<input type="checkbox"/> Surface water	
<b>How Determined:</b>	
Visual and soil sample analytical results	

## REMEDIALATION WORKPLAN

<b>Describe initial action taken</b> (if previously provided, refer to that form or document): A Form 19 describing the release was submitted to the COGCC on February 10, 2014 (Doc # 2147685). On February 8, 2014, fresh water was accidentally pumped into a full flowback tank causing the tank to overtop and release 2 bbls of flowback water onto the ground outside of containment. Upon discovering the release, the water truck pump was stopped and a vacuum truck was called to clean up the pooled liquid outside of containment. Due to the temperature, the majority of the released flowback water froze at the surface, so excavation equipment was dispatched to the site to excavate the ice and impacted surface soil.
<b>Describe how source is to be removed:</b> The frozen flowback water and impacted surface soil were scraped up until visual and olfactory observations indicated that all the petroleum hydrocarbon impacted soil had been excavated. Two confirmation soil samples (SS01@1" and SS02@1") were collected from the excavation area (Figure 1) and submitted for laboratory analysis of all COGCC Table 910-1 soil contaminants of concern.
<b>Describe how remediation of existing impacts is to be accomplished</b> , including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.: The impacted soil (5 yd <sup>3</sup> ) was transported to Waste Management's Buffalo Ridge landfill in Keenesburg, Colorado for disposal. A waste manifest summary documenting the disposal activities is attached.

## Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado  
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## REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

R. Allison

Tracking Number:

Bonanza Creek Energy Operating

Name of Operator:

Company LLC

OGCC Operator No:

8960

Received Date:

3/26/2014

Well Name &amp; No:

State North Platte F-J-26HC

Facility Name &amp; No.:

State North Platte F-26 Pad

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Groundwater was not encountered during excavation activities.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The Bonanza Creek production facility remains at the site. The excavation area was backfilled with clean soil and restored to its pre-release grade. As the release occurred within the footprint of the tank battery facility, reclamation is not necessary.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☒ N If yes, describe:

No further investigation is required at this site. Laboratory results for the confirmation soil samples indicate concentration levels of Table 910-1 contaminants of concern are below COGCC allowable levels at the extent of the excavation, with the exception of arsenic.

However, the arsenic concentrations present in soil samples SS01@1" and SS02@1" (1.34 mg/kg and 1.02 mg/kg, respectively) are less than the regional background arsenic concentration of 3.0 mg/kg established by the United States Geological Survey soil sample point (Severson, R.C., and Tourtelot, H.A., 1994, Assessment of geochemical variability and a listing of geochemical data for surface soils of the Front Range Urban Corridor, Colorado) located approximately 2.25 miles southwest of the site. A copy of the laboratory analytical report is attached. As all impacted material has been removed from the site and disposed of at licensed disposal facilities and the arsenic concentrations in the confirmation soil samples are below regional background levels, Bonanza Creek is requesting a No Further Action determination.

Final disposition of E&amp;P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

The impacted soil was transported to Waste Management's Buffalo Ridge landfill in Keenesburg, Colorado for disposal. A waste manifest summary documenting the disposal activities is attached.

## IMPLEMENTATION SCHEDULE

Date Site Investigation Began:

2/8/14

Date Site Investigation Completed:

2/11/14

Remediation Plan Submitted:

3/26/14

Remediation Start Date:

2/8/14

Anticipated Completion Date:

NA

Actual Completion Date:

2/11/14

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: **Brian Dodek**

Signed:

Title:

Environmental Specialist

Date:

3/26/14

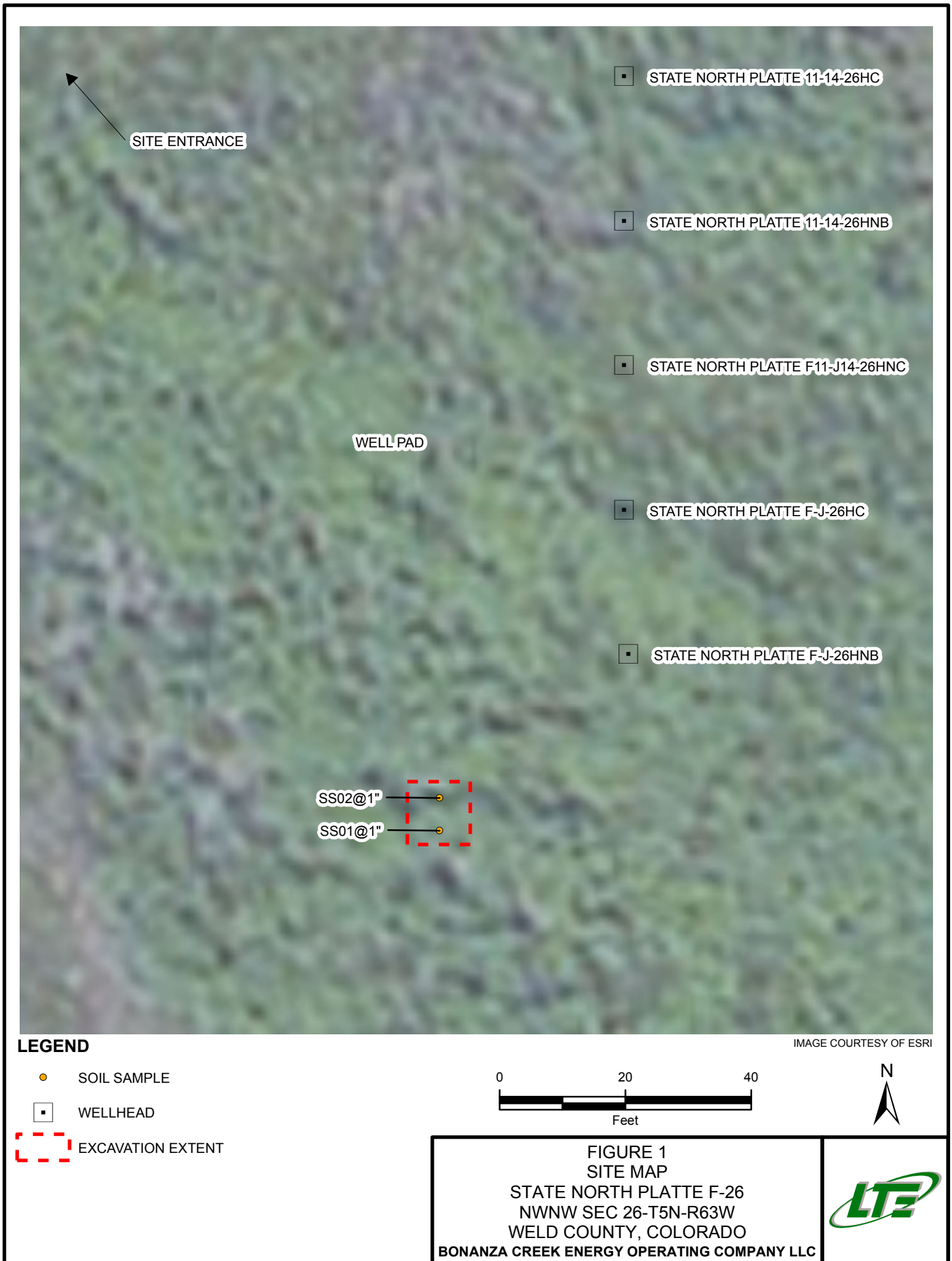
OGCC Approved:

Title:

Northeast EPS

Date:

4/17/2014



**TABLE 1**  
**SOIL SAMPLE ANALYTICAL RESULTS**  
**STATE NORTH PLATTE F-26 PAD**  
**WELD COUNTY, COLORADO**  
**BONANZA CREEK ENERGY OPERATING COMPANY, LLC.**

ANALYTICAL PARAMETER	COGCC STANDARDS	UNITS	Sample ID	
			SS01@1"	SS02@1"
Sample Date			2/11/2014	2/11/2014
Sample Depth			1"	1"
Arsenic	0.39	mg/kg	<b>1.34</b>	<b>1.02</b>
Barium (Total Metals Method)	15,000	mg/kg	75.7	43.1
Cadmium	70	mg/kg	<0.0849	<0.0897
Chromium (III)	120,000	mg/kg	8.64	3.47
Chromium (VI)	23	mg/kg	<1.12	<1.17
Copper	3,100	mg/kg	4.66	4.36
Lead	400	mg/kg	2.91	2.32
Mercury	23	mg/kg	<0.0426	<0.0437
Nickel	1,600	mg/kg	3.89	3.48
Selenium	390	mg/kg	<0.0425	<0.0448
Silver	390	mg/kg	<0.0849	<0.0897
Zinc	23,000	mg/kg	11.9	9.28
EC	4	mmhos/cm	1.64	1.39
pH	6 - 9	SU	7.93	7.95
SAR	12	unitless	1.83	1.03
TPH-GRO	-	mg/kg	3.5	5.1
TPH-DRO	-	mg/kg	110	220
Total TPH	500	mg/kg	113.5	225.1
Benzene	0.17	mg/kg	0.0053	0.0030
Toluene	85	mg/kg	0.019	0.0073
Ethylbenzene	100	mg/kg	0.0081	<0.0050
Total Xylenes	175	mg/kg	0.053	0.024
Acenaphthene	1,000	mg/kg	<0.00500	<0.00500
Anthracene	1,000	mg/kg	<0.00500	<0.00500
Benzo (A) anthracene	0.22	mg/kg	0.0197	0.0214
Benzo (B) fluoranthene	0.22	mg/kg	<0.00500	<0.00500
Benzo (K) fluoranthene	2.2	mg/kg	<0.00500	<0.00500
Benzo (A) pyrene	0.022	mg/kg	0.00545	0.00594
Chrysene	22	mg/kg	0.0185	0.0188
Dibenzo (A,H) anthracene	0.022	mg/kg	<0.00500	<0.00500
Fluoranthene	1,000	mg/kg	<0.00500	<0.00500
Fluorene	1,000	mg/kg	0.0584	0.0644
Indeno (1,2,3-C,D) pyrene	0.22	mg/kg	<0.00500	<0.00500
Naphthalene	23	mg/kg	0.0342	0.0542
Pyrene	1,000	mg/kg	0.0297	0.0166

**NOTES:**

" - inch

COGCC - Colorado Oil and Gas Conservation Commission

mg/kg - milligrams per kilogram

EC - electrical conductivity

mmhos/cm - millimhos per centimeter

SU - standard unit

SAR - sodium adsorption ratio

TPH - total petroleum hydrocarbons

GRO - gasoline range organics

DRO - diesel range organics

Total TPH - combination of GRO and DRO

< - less than the stated reporting limit

**BOLD** - indicates result exceeds the COGCC Table 910-1 concentration level



# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

February 17, 2014

John Cocroft

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: BC - State North Platte F-26 Pad

Enclosed are the results of analyses for samples received by Summit Scientific on 02/11/14 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'BS' or 'Shrewsbury', written in a cursive style.

Ben Shrewsbury

President / Laboratory Manager



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

Project: BC - State North Platte F-26 Pad

Project Number: 0345-14002  
Project Manager: John Cocroft

**Reported:**  
02/17/14 16:52

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@1"	1402046-01	Soil	02/11/14 11:20	02/11/14 17:00
SS02@1"	1402046-02	Soil	02/11/14 10:50	02/11/14 17:00

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: BC - State North Platte F-26 Pad

Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

1402046

**Summit Scientific**

S2

741 Corporate Circle, Suite 100 • Golden, Colorado 80401  
303-277-9310 • 303-374-5933

Client: LT Environmental, Inc.  
Address: 4600 West 60th Avenue  
City/State/Zip: Arvada, CO 80003  
Phone: 303-433-9788  
Fax: 303-433-1432  
Sampler Name: Lee S. S. S. S.

Project Manager: John Cocroft  
Email: [ccroft@ltenv.com](mailto:ccroft@ltenv.com), [munger@ltenv.com](mailto:munger@ltenv.com), [kenny@ltenv.com](mailto:kenny@ltenv.com), [mahaverson@ltenv.com](mailto:mahaverson@ltenv.com), [isommon@ltenv.com](mailto:isommon@ltenv.com), [averbont@ltenv.com](mailto:averbont@ltenv.com), [jespinosa@ltenv.com](mailto:jespinosa@ltenv.com), [jdochter@ltenv.com](mailto:jdochter@ltenv.com)  
Project Name: State North Platte F-26 Pad  
Project Number: 0345-14002

Page 1 of 1

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)		
1	SS01 (A) 1"	2/11/14	11:25	2		X				X				
2	SS02 (B) 1"	2/11/14	16:50	2		X				X				
3														
4														
5														
6														
7														
8														
9														
10														

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check)	Notes:
	2-11-14	<i>[Signature]</i>	2/11/14 1700	Same Day <input type="checkbox"/> 72 hours <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/>	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:	
				Temperature Upon Receipt: <u>50</u>	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Infect: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

www.s2scientific.com

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Arvada CO, 80003

Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

SS01@1"  
1402046-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	110	50	mg/kg	1	1402080	02/11/14	02/13/14	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		92.5 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.0053	0.0020	mg/kg	1	1402079	02/11/14	02/13/14	EPA 8260B	
Toluene	0.019	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0081	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.053	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	3.5	0.50	"	"	"	"	"	"	

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270D SIM

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	5.00	ug/kg	1	1402088	02/12/14	02/13/14	EPA 8270D SIM	

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4600 West 60th Avenue  
Arvada CO, 80003

Project: BC - State North Platte F-26 Pad

Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

SS01@1"  
1402046-01 (Soil)

### Summit Scientific

#### Semivolatile Organic Compounds by EPA Method 8270D SIM

Acenaphthylene	ND	5.00	ug/kg	1	1402088	02/12/14	02/13/14	EPA 8270D SIM
Anthracene	ND	5.00	"	"	"	"	"	"
<b>Benzo (a) anthracene</b>	<b>19.7</b>	5.00	"	"	"	"	"	"
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"
Benzo (g,h,i) perylene	ND	5.00	"	"	"	"	"	"
<b>Benzo (a) pyrene</b>	<b>5.45</b>	5.00	"	"	"	"	"	"
<b>Chrysene</b>	<b>18.5</b>	5.00	"	"	"	"	"	"
Dibenz (a,h) anthracene	ND	5.00	"	"	"	"	"	"
Fluoranthene	ND	5.00	"	"	"	"	"	"
<b>Fluorene</b>	<b>58.4</b>	5.00	"	"	"	"	"	"
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"
<b>Naphthalene</b>	<b>34.2</b>	5.00	"	"	"	"	"	"
<b>Phenanthrene</b>	<b>160</b>	5.00	"	"	"	"	"	"
<b>Pyrene</b>	<b>29.7</b>	5.00	"	"	"	"	"	"

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 2-Methylnaphthalene-d10		103 %	50-150		"	"	"	"	
Surrogate: Fluoranthene-d10		94.3 %	50-150		"	"	"	"	

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

Date Sampled: 02/11/14 11:20

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Arsenic</b>	<b>1.34</b>	0.0849	mg/kg dry	1	1402099	02/14/14	02/14/14	EPA 6020A	
<b>Barium</b>	<b>75.7</b>	0.0849	"	"	"	"	"	"	
Cadmium	ND	0.0849	"	"	"	"	"	"	
<b>Chromium</b>	<b>9.76</b>	0.425	"	"	"	"	"	"	
<b>Copper</b>	<b>4.66</b>	0.425	"	"	"	"	"	"	
<b>Lead</b>	<b>2.91</b>	0.0849	"	"	"	"	"	"	
<b>Nickel</b>	<b>3.89</b>	0.0849	"	"	"	"	"	"	
Selenium	ND	0.0425	"	"	"	"	"	"	
Silver	ND	0.0849	"	"	"	"	"	"	
<b>Zinc</b>	<b>11.9</b>	8.49	"	"	"	"	"	"	

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

Project: BC - State North Platte F-26 Pad

Project Number: 0345-14002  
Project Manager: John Cocroft

**Reported:**  
02/17/14 16:52

**SS01@1"**  
**1402046-01 (Soil)**

**Summit Scientific**

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

**Total Mercury by EPA Method 7471/7470/245.1**

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0426	mg/kg dry	1	1402095	02/14/14	02/14/14	EPA 7471	

**Hexavalent Chromium by EPA 7196**

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	1.12	mg/kg dry	1	1402097	02/14/14	02/14/14	EPA 7196	

**Calculated Analytes**

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Chromium+3 Calculated</b>	<b>8.64</b>	1.00	mg/kg	1	1402123	02/17/14	02/17/14	Calculation	

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

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>779</b>	8.91	mg/kg dry	1	1402070	02/12/14	02/12/14	EPA 6020/Mod. USDA60 6(2, 3A)	
<b>Magnesium</b>	<b>106</b>	4.45	"	"	"	"	"	"	
<b>Sodium</b>	<b>205</b>	4.45	"	"	"	"	"	"	

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>1.83</b>		units	"	1402116	02/17/14	02/17/14	"	

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Project: BC - State North Platte F-26 Pad

Project Number: 0345-14002  
Project Manager: John Cocroft

**Reported:**  
02/17/14 16:52

**SS01@1"**  
**1402046-01 (Soil)**

**Summit Scientific**

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

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>1.64</b>	0.0100	mmhos/cm	1	1402081	02/11/14	02/13/14	SM 2510B	

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>pH</b>	<b>7.93</b>	0.100	pH Units	"	1402082	02/11/14	02/13/14	EPA 9045	

Date Sampled: **02/11/14 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>89.1</b>		%	"	1402102	02/14/14	02/14/14	% calculation	

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LT Environmental, Inc.  
4600 West 60th Avenue  
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Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

**SS02@1"**  
**1402046-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (TEPH-DRO)</b>	<b>220</b>	50	mg/kg	1	1402080	02/11/14	02/13/14	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		106 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.0030</b>	0.0020	mg/kg	1	1402079	02/11/14	02/13/14	EPA 8260B	
<b>Toluene</b>	<b>0.0073</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.024</b>	0.0050	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>5.1</b>	0.50	"	"	"	"	"	"	

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

**Semivolatile Organic Compounds by EPA Method 8270D SIM**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	5.00	ug/kg	1	1402088	02/12/14	02/14/14	EPA 8270D SIM	

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

Project: BC - State North Platte F-26 Pad

Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

SS02@1"  
1402046-02 (Soil)

### Summit Scientific

#### Semivolatile Organic Compounds by EPA Method 8270D SIM

Acenaphthylene	ND	5.00	ug/kg	1	1402088	02/12/14	02/14/14	EPA 8270D SIM
Anthracene	ND	5.00	"	"	"	"	"	"
<b>Benzo (a) anthracene</b>	<b>21.4</b>	5.00	"	"	"	"	"	"
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"
Benzo (g,h,i) perylene	ND	5.00	"	"	"	"	"	"
<b>Benzo (a) pyrene</b>	<b>5.94</b>	5.00	"	"	"	"	"	"
<b>Chrysene</b>	<b>18.8</b>	5.00	"	"	"	"	"	"
Dibenz (a,h) anthracene	ND	5.00	"	"	"	"	"	"
Fluoranthene	ND	5.00	"	"	"	"	"	"
<b>Fluorene</b>	<b>64.4</b>	5.00	"	"	"	"	"	"
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"
<b>Naphthalene</b>	<b>54.2</b>	5.00	"	"	"	"	"	"
<b>Phenanthrene</b>	<b>132</b>	5.00	"	"	"	"	"	"
<b>Pyrene</b>	<b>16.6</b>	5.00	"	"	"	"	"	"

Date Sampled: 02/11/14 10:50

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 2-Methylnaphthalene-d10		98.6 %	50-150		"	"	"	"	
Surrogate: Fluoranthene-d10		86.4 %	50-150		"	"	"	"	

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

Date Sampled: 02/11/14 10:50

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Arsenic</b>	<b>1.02</b>	0.0897	mg/kg dry	1	1402099	02/14/14	02/14/14	EPA 6020A	
<b>Barium</b>	<b>43.1</b>	0.0897	"	"	"	"	"	"	
Cadmium	ND	0.0897	"	"	"	"	"	"	
<b>Chromium</b>	<b>4.64</b>	0.448	"	"	"	"	"	"	
<b>Copper</b>	<b>4.36</b>	0.448	"	"	"	"	"	"	
<b>Lead</b>	<b>2.32</b>	0.0897	"	"	"	"	"	"	
<b>Nickel</b>	<b>3.48</b>	0.0897	"	"	"	"	"	"	
Selenium	ND	0.0448	"	"	"	"	"	"	
Silver	ND	0.0897	"	"	"	"	"	"	
<b>Zinc</b>	<b>9.28</b>	8.97	"	"	"	"	"	"	

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02/17/14 16:52

**SS02@1"**  
**1402046-02 (Soil)**

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

**Total Mercury by EPA Method 7471/7470/245.1**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0437	mg/kg dry	1	1402095	02/14/14	02/14/14	EPA 7471	

**Hexavalent Chromium by EPA 7196**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	1.17	mg/kg dry	1	1402097	02/14/14	02/14/14	EPA 7196	

**Calculated Analytes**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Chromium+3 Calculated</b>	<b>3.47</b>	1.00	mg/kg	1	1402123	02/17/14	02/17/14	Calculation	

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

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>631</b>	9.23	mg/kg dry	1	1402070	02/12/14	02/12/14	EPA 6020/Mod. USDA60 6(2, 3A)	
<b>Magnesium</b>	<b>71.7</b>	4.61	"	"	"	"	"	"	
<b>Sodium</b>	<b>102</b>	4.61	"	"	"	"	"	"	

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>1.03</b>		units	"	1402116	02/17/14	02/17/14	"	

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**Reported:**  
02/17/14 16:52

**SS02@1"**  
**1402046-02 (Soil)**

**Summit Scientific**

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

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>1.39</b>	0.0100	mmhos/cm	1	1402081	02/11/14	02/13/14	SM 2510B	

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>pH</b>	<b>7.95</b>	0.100	pH Units	"	1402082	02/11/14	02/13/14	EPA 9045	

Date Sampled: **02/11/14 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>85.2</b>		%	"	1402102	02/14/14	02/14/14	% calculation	

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Project Number: 0345-14002  
Project Manager: John Cocroft

**Reported:**  
02/17/14 16:52

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

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

**Batch 1402080 - EPA 3550A**

<b>Blank (1402080-BLK1)</b>				Prepared: 02/11/14 Analyzed: 02/12/14						
C10-C28 (TEPH-DRO)	ND	50	mg/kg							
C28-C36 (TEPH-ORO)	ND	50	"							
<b>LCS (1402080-BS1)</b>				Prepared: 02/11/14 Analyzed: 02/12/14						
C10-C28 (TEPH-DRO)	563	50	mg/kg	501		112	73-134			
<b>LCS (1402080-BS2)</b>				Prepared: 02/11/14 Analyzed: 02/12/14						
C10-C28 (TEPH-DRO)	480	50	mg/kg	501		95.8	73-134			
<b>Matrix Spike (1402080-MS1)</b>				<b>Source: 1402036-01</b>		Prepared: 02/11/14 Analyzed: 02/12/14				
C10-C28 (TEPH-DRO)	493	50	mg/kg	456	207	62.5	50-148			
<b>Matrix Spike (1402080-MS2)</b>				<b>Source: 1402036-02</b>		Prepared: 02/11/14 Analyzed: 02/13/14				
C10-C28 (TEPH-DRO)	426	50	mg/kg	461	ND	92.3	50-148			
<b>Matrix Spike Dup (1402080-MSD1)</b>				<b>Source: 1402036-01</b>		Prepared: 02/11/14 Analyzed: 02/12/14				
C10-C28 (TEPH-DRO)	450	50	mg/kg	456	207	53.1	50-148	9.11	13	
<b>Matrix Spike Dup (1402080-MSD2)</b>				<b>Source: 1402036-02</b>		Prepared: 02/11/14 Analyzed: 02/13/14				
C10-C28 (TEPH-DRO)	471	50	mg/kg	466	ND	101	50-148	10.1	13	

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Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

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

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

**Batch 1402079 - EPA 5030 Soil MS**

**Blank (1402079-BLK1)**

Prepared: 02/11/14 Analyzed: 02/12/14

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0456		"	0.0397		115	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0434		"	0.0400		109	21-167			

**LCS (1402079-BS1)**

Prepared: 02/11/14 Analyzed: 02/12/14

Benzene	0.111	0.0020	mg/kg	0.0997		111	58-130			
Toluene	0.114	0.0050	"	0.100		114	61-134			
Ethylbenzene	0.121	0.0050	"	0.0992		122	74-139			
m,p-Xylene	0.238	0.010	"	0.200		119	73-137			
o-Xylene	0.124	0.0050	"	0.0988		125	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0442		"	0.0397		111	23-173			
Surrogate: Toluene-d8	0.0400		"	0.0400		99.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0409		"	0.0400		102	21-167			

**LCS (1402079-BS2)**

Prepared: 02/11/14 Analyzed: 02/12/14

Benzene	0.111	0.0020	mg/kg	0.0997		112	58-130			
Toluene	0.114	0.0050	"	0.100		114	61-134			
Ethylbenzene	0.124	0.0050	"	0.0992		125	74-139			
m,p-Xylene	0.245	0.010	"	0.200		123	73-137			
o-Xylene	0.129	0.0050	"	0.0988		130	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0397		108	23-173			
Surrogate: Toluene-d8	0.0394		"	0.0400		98.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0413		"	0.0400		103	21-167			

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4600 West 60th Avenue  
Arvada CO, 80003

Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

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

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

**Batch 1402079 - EPA 5030 Soil MS**

Matrix Spike (1402079-MS1)		Source: 1402036-01			Prepared: 02/11/14		Analyzed: 02/12/14			
Benzene	0.103	0.0020	mg/kg	0.0925	ND	111	30-131			
Toluene	0.109	0.0050	"	0.0928	0.0153	100	30-134			
Ethylbenzene	0.118	0.0050	"	0.0920	0.00370	124	22-153			
m,p-Xylene	0.275	0.010	"	0.186	0.103	92.5	10-159			
o-Xylene	0.141	0.0050	"	0.0917	0.0482	101	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0404		"	0.0368		110	23-173			
Surrogate: Toluene-d8	0.0368		"	0.0371		99.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0380		"	0.0371		102	21-167			

Matrix Spike (1402079-MS2)		Source: 1402036-02			Prepared: 02/11/14		Analyzed: 02/12/14			
Benzene	0.104	0.0020	mg/kg	0.0937	ND	111	30-131			
Toluene	0.107	0.0050	"	0.0940	0.00319	111	30-134			
Ethylbenzene	0.121	0.0050	"	0.0932	ND	130	22-153			
m,p-Xylene	0.253	0.010	"	0.188	0.0101	129	10-159			
o-Xylene	0.139	0.0050	"	0.0929	0.0104	139	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0373		111	23-173			
Surrogate: Toluene-d8	0.0377		"	0.0376		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0379		"	0.0376		101	21-167			

Matrix Spike Dup (1402079-MSD1)		Source: 1402036-01			Prepared: 02/11/14		Analyzed: 02/12/14			
Benzene	0.106	0.0020	mg/kg	0.0935	ND	114	30-131	3.59	34	
Toluene	0.118	0.0050	"	0.0938	0.0153	109	30-134	8.38	30	
Ethylbenzene	0.125	0.0050	"	0.0931	0.00370	130	22-153	5.62	24	
m,p-Xylene	0.348	0.010	"	0.188	0.103	131	10-159	23.6	68	
o-Xylene	0.175	0.0050	"	0.0927	0.0482	137	31-151	21.3	38	
Surrogate: 1,2-Dichloroethane-d4	0.0429		"	0.0372		115	23-173			
Surrogate: Toluene-d8	0.0390		"	0.0375		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0375		103	21-167			

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Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

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

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

**Batch 1402079 - EPA 5030 Soil MS**

Matrix Spike Dup (1402079-MSD2)		Source: 1402036-02			Prepared: 02/11/14		Analyzed: 02/12/14			
Benzene	0.106	0.0020	mg/kg	0.0941	ND	113	30-131	2.45	34	
Toluene	0.110	0.0050	"	0.0943	0.00319	113	30-134	2.09	30	
Ethylbenzene	0.120	0.0050	"	0.0936	ND	128	22-153	1.10	24	
m,p-Xylene	0.244	0.010	"	0.189	0.0101	124	10-159	3.55	68	
o-Xylene	0.132	0.0050	"	0.0932	0.0104	130	31-151	5.42	38	
Surrogate: 1,2-Dichloroethane-d4	0.0431		"	0.0375		115	23-173			
Surrogate: Toluene-d8	0.0384		"	0.0377		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0378		"	0.0377		100	21-167			

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Project Manager: John Cocroft

Reported:  
02/17/14 16:52

**Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control**  
**Summit Scientific**

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

**Batch 1402088 - EPA 5030 Soil MS**

**Blank (1402088-BLK1)**

Prepared: 02/12/14 Analyzed: 02/13/14

Acenaphthene	ND	5.00	ug/kg							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzo (g,h,i) perylene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Chrysene	ND	5.00	"							
Dibenz (a,h) anthracene	ND	5.00	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Naphthalene	ND	5.00	"							
Phenanthrene	ND	5.00	"							
Pyrene	ND	5.00	"							
Surrogate: 2-Methylnaphthalene-d10	32.5		"	34.6		94.0	50-150			
Surrogate: Fluoranthene-d10	33.5		"	34.8		96.1	50-150			

**LCS (1402088-BS1)**

Prepared: 02/12/14 Analyzed: 02/13/14

Acenaphthene	30.7	5.00	ug/kg	33.3		92.2	50-150			
Acenaphthylene	32.0	5.00	"	33.3		96.0	50-150			
Anthracene	28.9	5.00	"	33.3		86.7	50-150			
Benzo (a) anthracene	33.5	5.00	"	33.3		101	50-150			
Benzo (b) fluoranthene	31.3	5.00	"	33.3		94.0	50-150			
Benzo (k) fluoranthene	30.9	5.00	"	33.3		92.6	50-150			
Benzo (g,h,i) perylene	33.1	5.00	"	33.3		99.3	50-150			
Benzo (a) pyrene	33.0	5.00	"	33.3		99.0	50-150			
Chrysene	32.1	5.00	"	33.3		96.4	50-150			
Dibenz (a,h) anthracene	32.8	5.00	"	33.3		98.4	50-150			
Fluoranthene	31.0	5.00	"	33.3		92.9	50-150			
Fluorene	33.6	5.00	"	33.3		101	50-150			
Indeno (1,2,3-cd) pyrene	33.4	5.00	"	33.3		100	50-150			
Naphthalene	29.5	5.00	"	33.3		88.5	50-150			
Phenanthrene	33.6	5.00	"	33.3		101	50-150			
Pyrene	33.9	5.00	"	33.3		102	50-150			
Surrogate: 2-Methylnaphthalene-d10	30.8		"	34.6		89.0	50-150			
Surrogate: Fluoranthene-d10	32.5		"	34.8		93.5	50-150			

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Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

**Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control**  
**Summit Scientific**

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

**Batch 1402088 - EPA 5030 Soil MS**

Duplicate (1402088-DUP1)				Source: 1402032-01		Prepared: 02/12/14		Analyzed: 02/13/14	
Acenaphthene	ND	5.00	ug/kg		ND				200
Acenaphthylene	ND	5.00	"		18.9				200
Anthracene	ND	5.00	"		ND				200
Benzo (a) anthracene	116	5.00	"		86.3			29.1	200
Benzo (b) fluoranthene	ND	5.00	"		ND				200
Benzo (k) fluoranthene	ND	5.00	"		9.28				200
Benzo (g,h,i) perylene	13.4	5.00	"		18.8			33.8	200
Benzo (a) pyrene	ND	5.00	"		28.3				200
Chrysene	102	5.00	"		74.9			30.5	200
Dibenz (a,h) anthracene	ND	5.00	"		ND				200
Fluoranthene	ND	5.00	"		15.6				200
Fluorene	117	5.00	"		143			19.5	200
Indeno (1,2,3-cd) pyrene	7.02	5.00	"		14.3			68.1	200
Naphthalene	465	50.0	"		339			31.3	200
Phenanthrene	459	50.0	"		348			27.3	200
Pyrene	361	50.0	"		188			62.8	200
Surrogate: 2-Methylnaphthalene-d10	28.2		"	34.6		81.5	50-150		
Surrogate: Fluoranthene-d10	24.0		"	34.8		68.9	50-150		

Matrix Spike (1402088-MS1)				Source: 1402031-01		Prepared: 02/12/14		Analyzed: 02/14/14	
Acenaphthene	388	50.0	ug/kg	333	ND	116	50-150		
Acenaphthylene	357	50.0	"	333	ND	107	50-150		
Anthracene	323	50.0	"	333	ND	97.0	50-150		
Benzo (a) anthracene	375	50.0	"	333	459	NR	50-150		QM-07
Benzo (b) fluoranthene	511	50.0	"	333	ND	153	50-150		QM-07
Benzo (k) fluoranthene	314	50.0	"	333	ND	94.3	50-150		
Benzo (g,h,i) perylene	238	50.0	"	333	ND	71.4	50-150		
Benzo (a) pyrene	349	50.0	"	333	ND	105	50-150		
Chrysene	635	50.0	"	333	398	71.1	50-150		
Dibenz (a,h) anthracene	239	50.0	"	333	ND	71.6	50-150		
Fluoranthene	387	50.0	"	333	ND	116	50-150		
Fluorene	391	50.0	"	333	65.1	97.8	50-150		
Indeno (1,2,3-cd) pyrene	246	50.0	"	333	ND	73.7	50-150		
Naphthalene	618	50.0	"	333	72.2	164	50-150		QM-07
Phenanthrene	823	50.0	"	333	338	146	50-150		
Pyrene	1060	50.0	"	333	300	229	50-150		QM-07
Surrogate: 2-Methylnaphthalene-d10	145		"	34.6		420	50-150		QM-07
Surrogate: Fluoranthene-d10	90.1		"	34.8		259	50-150		QM-07

Summit Scientific

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

Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

**Semivolatile Organic Compounds by EPA Method 8270D SIM - Quality Control**  
**Summit Scientific**

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

**Batch 1402088 - EPA 5030 Soil MS**

Matrix Spike (1402088-MS2)		Source: 1402053-01			Prepared: 02/12/14		Analyzed: 02/14/14	
Acenaphthene	30100	4500	ug/kg	3000	ND	1000	50-150	
Acenaphthylene	32300	4500	"	3000	ND	NR	50-150	
Anthracene	27000	4500	"	3000	ND	899	50-150	
Benzo (a) anthracene	35600	4500	"	3000	ND	NR	50-150	
Benzo (b) fluoranthene	52200	4500	"	3000	ND	NR	50-150	
Benzo (k) fluoranthene	36200	4500	"	3000	ND	NR	50-150	
Benzo (g,h,i) perylene	11300	4500	"	3000	ND	377	50-150	
Benzo (a) pyrene	32600	4500	"	3000	ND	NR	50-150	
Chrysene	27800	4500	"	3000	ND	925	50-150	
Dibenz (a,h) anthracene	13400	4500	"	3000	ND	447	50-150	
Fluoranthene	24000	4500	"	3000	ND	801	50-150	
Fluorene	31200	4500	"	3000	ND	NR	50-150	
Indeno (1,2,3-cd) pyrene	13200	4500	"	3000	ND	441	50-150	
Naphthalene	66400	4500	"	3000	37000	982	50-150	
Phenanthrene	37600	4500	"	3000	ND	NR	50-150	
Pyrene	41200	4500	"	3000	ND	NR	50-150	
Surrogate: 2-Methylnaphthalene-d10	33500		"	3110		NR	50-150	
Surrogate: Fluoranthene-d10	26000		"	3130		829	50-150	

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Project Manager: John Cocroft

Reported:  
02/17/14 16:52

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

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

**Batch 1402099 - EPA 3050B**

**Blank (1402099-BLK1)**

Prepared & Analyzed: 02/14/14

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

**LCS (1402099-BS1)**

Prepared & Analyzed: 02/14/14

Arsenic	2.16	0.100	mg/kg wet	2.49	86.9	80-120
Barium	220	0.100	"	224	98.1	80-120
Cadmium	0.825	0.100	"	0.998	82.7	80-120
Chromium	9.16	0.500	"	9.98	91.8	80-120
Copper	19.3	0.500	"	19.9	97.2	80-120
Lead	7.07	0.100	"	7.48	94.5	80-120
Nickel	14.1	0.100	"	15.0	94.2	80-120
Selenium	1.25	0.0500	"	1.25	100	80-120
Silver	0.222	0.100	"	0.249	89.1	80-120
Zinc	6.89	10.0	"	7.48	92.1	80-120

**Matrix Spike (1402099-MS1)**

Source: 1402046-01

Prepared & Analyzed: 02/14/14

Arsenic	2.75	0.0848	mg/kg dry	2.12	1.34	66.6	75-125	QM-07
Barium	242	0.0848	"	191	75.7	86.8	75-125	
Cadmium	0.701	0.0848	"	0.851	0.0764	73.4	75-125	QM-07
Chromium	18.6	0.424	"	8.51	9.76	104	75-125	
Copper	18.1	0.424	"	17.0	4.66	79.2	75-125	
Lead	8.27	0.0848	"	6.38	2.91	84.1	75-125	
Nickel	15.6	0.0848	"	12.8	3.89	91.7	75-125	
Selenium	0.785	0.0424	"	1.06	0.00497	73.4	75-125	QM-07
Silver	0.119	0.0848	"	0.212	0.0128	50.0	75-125	QM-07
Zinc	15.9	8.48	"	6.38	11.9	62.2	75-125	QM-07

Summit Scientific

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Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

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

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

**Batch 1402099 - EPA 3050B**

Matrix Spike Dup (1402099-MSD1)		Source: 1402046-01			Prepared & Analyzed: 02/14/14						
Arsenic	2.84	0.0851	mg/kg dry	2.11	1.34	71.2	75-125	3.20	25		QM-07
Barium	255	0.0851	"	190	75.7	94.2	75-125	5.27	25		
Cadmium	0.768	0.0851	"	0.846	0.0764	81.7	75-125	9.16	25		
Chromium	19.7	0.426	"	8.46	9.76	117	75-125	5.68	25		
Copper	18.1	0.426	"	16.9	4.66	79.8	75-125	0.232	25		
Lead	9.07	0.0851	"	6.35	2.91	97.2	75-125	9.24	25		
Nickel	15.6	0.0851	"	12.7	3.89	92.1	75-125	0.0923	25		
Selenium	0.699	0.0426	"	1.06	0.00497	65.6	75-125	11.6	25		QM-07
Silver	0.148	0.0851	"	0.211	0.0128	63.9	75-125	21.6	25		QM-07
Zinc	17.4	8.51	"	6.35	11.9	86.0	75-125	8.99	25		

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Project Manager: John Cocroft

Reported:  
02/17/14 16:52

**Total Mercury by EPA Method 7471/7470/245.1 - Quality Control**  
**Summit Scientific**

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

**Batch 1402095 - EPA 7471A**

<b>Blank (1402095-BLK1)</b>				Prepared & Analyzed: 02/14/14							
Mercury	ND	0.0500	mg/kg wet								
<b>LCS (1402095-BS1)</b>				Prepared & Analyzed: 02/14/14							
Mercury	0.394	0.0500	mg/kg wet	0.400		98.4	80-120				
<b>LCS Dup (1402095-BSD1)</b>				Prepared & Analyzed: 02/14/14							
Mercury	0.371	0.0500	mg/kg wet	0.400		92.6	80-120	6.04	20		
<b>Matrix Spike (1402095-MS1)</b>				<b>Source: 1402046-01</b>		Prepared & Analyzed: 02/14/14					
Mercury	0.343	0.0417	mg/kg dry	0.334	0.00454	102	80-120				
<b>Matrix Spike Dup (1402095-MSD1)</b>				<b>Source: 1402046-01</b>		Prepared & Analyzed: 02/14/14					
Mercury	0.339	0.0416	mg/kg dry	0.333	0.00454	100	80-120	1.32	20		

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Reported:  
02/17/14 16:52

**Hexavalent Chromium by EPA 7196 - Quality Control**  
**Summit Scientific**

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

**Batch 1402097 - General Preparation**

<b>Blank (1402097-BLK1)</b>				Prepared & Analyzed: 02/14/14							
Chromium, Hexavalent	ND	1.00	mg/kg wet								
<b>LCS (1402097-BS1)</b>				Prepared & Analyzed: 02/14/14							
Chromium, Hexavalent	142	1.25	mg/kg wet	156		91.0	85-115				
<b>LCS Dup (1402097-BSD1)</b>				Prepared & Analyzed: 02/14/14							
Chromium, Hexavalent	146	1.25	mg/kg wet	157		93.2	85-115	3.02	20		
<b>Duplicate (1402097-DUP1)</b>				<b>Source: 1402046-01</b>		Prepared & Analyzed: 02/14/14					
Chromium, Hexavalent	ND	1.12	mg/kg dry		ND					20	
<b>Matrix Spike (1402097-MS1)</b>				<b>Source: 1402046-01</b>		Prepared & Analyzed: 02/14/14					
Chromium, Hexavalent	41.4	1.12	mg/kg dry	44.7	ND	92.8	85-115				

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Reported:  
02/17/14 16:52

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

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

**Batch 1402070 - General Preparation**

**Blank (1402070-BLK1)**

Prepared & Analyzed: 02/12/14

Calcium	ND	10.0	mg/kg wet
Magnesium	ND	5.00	"
Sodium	ND	50.0	"

**LCS (1402070-BS1)**

Prepared & Analyzed: 02/12/14

Calcium	373	10.0	mg/kg wet	394	94.5	80-120
Magnesium	186	5.00	"	198	93.9	80-120
Sodium	494	50.0	"	493	100	80-120

**LCS Dup (1402070-BSD1)**

Prepared & Analyzed: 02/12/14

Calcium	386	10.0	mg/kg wet	399	97.0	80-120	3.65	20
Magnesium	196	5.00	"	200	98.3	80-120	5.64	20
Sodium	513	50.0	"	499	103	80-120	3.85	20

**Matrix Spike (1402070-MS1)**

Source: 1402035-01

Prepared & Analyzed: 02/12/14

Calcium	2220	10.7	mg/kg dry	427	1590	149	75-125	QM-07
Magnesium	333	5.34	"	214	117	101	75-125	
Sodium	3220	53.4	"	534	2330	167	75-125	QM-07

**Matrix Spike Dup (1402070-MSD1)**

Source: 1402035-01

Prepared & Analyzed: 02/12/14

Calcium	1970	10.8	mg/kg dry	425	1590	89.2	75-125	12.2	25
Magnesium	314	5.38	"	213	117	92.5	75-125	5.76	25
Sodium	2760	53.8	"	532	2330	81.0	75-125	15.4	25

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Project: BC - State North Platte F-26 Pad  
Project Number: 0345-14002  
Project Manager: John Cocroft

Reported:  
02/17/14 16:52

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

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

**Batch 1402081 - General Preparation**

<b>Blank (1402081-BLK1)</b>					Prepared: 02/11/14 Analyzed: 02/13/14						
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
<b>Blank (1402081-BLK2)</b>					Prepared: 02/11/14 Analyzed: 02/13/14						
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
<b>Duplicate (1402081-DUP1)</b>					<b>Source: 1402037-01</b> Prepared: 02/11/14 Analyzed: 02/13/14						
Specific Conductance (EC)	1.29	0.0100	mmhos/cm		1.33			3.21	20		
<b>Duplicate (1402081-DUP2)</b>					<b>Source: 1402037-02</b> Prepared: 02/11/14 Analyzed: 02/13/14						
Specific Conductance (EC)	1.90	0.0100	mmhos/cm		1.82			4.47	20		

**Batch 1402082 - General Preparation**

<b>LCS (1402082-BS1)</b>					Prepared: 02/11/14 Analyzed: 02/13/14						
pH	ND	0.100	pH Units				0-200				
<b>LCS (1402082-BS2)</b>					Prepared: 02/11/14 Analyzed: 02/13/14						
pH	ND	0.100	pH Units				0-200				
<b>Duplicate (1402082-DUP1)</b>					<b>Source: 1402037-01</b> Prepared: 02/11/14 Analyzed: 02/13/14						
pH	8.90	0.100	pH Units		9.25			3.86	20		
<b>Duplicate (1402082-DUP2)</b>					<b>Source: 1402037-02</b> Prepared: 02/11/14 Analyzed: 02/13/14						
pH	8.83	0.100	pH Units		8.86			0.339	20		

**Batch 1402102 - General Preparation**

<b>Duplicate (1402102-DUP1)</b>					<b>Source: 1402046-01</b> Prepared & Analyzed: 02/14/14						
% Solids	88.9		%		89.1			0.225	20		

Summit Scientific

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Project Number: 0345-14002  
Project Manager: John Cocroft

**Reported:**  
02/17/14 16:52

### 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





**BONANZA  
CREEK**

# Waste Removal Worksheet

[illegible]

Job Total: Loads / Yards 1 load / 5 Yards