

State of Colorado
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

Doc #2099820
Rem #9514
Rec 2/21/2016

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

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.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): On-site cutting incorporation approval

OGCC Operator Number: 96340

Name of Operator: Wiepking-Fullerton Energy L.L.C.

Address: 4600 S. Downing Street

City: Englewood State: CO Zip: 80113

Contact Name and Telephone:

Linda Boone

No: (720)941-0791

Fax: None

API Number: 05-073-06389

County: Lincoln

Facility Name: Aloha Mula 6

Facility Number: 413110

Well Name: Aloha Mula

Well Number: 6

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SWNE, 19, 10S, 55W, 6 PM Latitude: 39.166571 Longitude: -103.591433

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Drill Cuttings

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☒ N 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: Valent-Bijou Complex, 1-2% Slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is greater than 5,280 feet, No water wells within 0.25 mile, occupied building greater than 3,000 feet.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):

Extent of Impact:

How Determined:

☐

Soils

☒

Vegetation

0.46 Acres

Visual Inspection

☐

Groundwater

☐

Surface Water

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Background soil sampling, drill cuttings soil sampling, and point of release boring hole soil sampling was conducted. Please see attached Remediation and Reclamation Workplan for details.

Describe how source is to be removed:

Drill cuttings will be incorporated into the native soils.

Describe how remediation of existing impacts is to be accomplished, 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.:

Existing drill cuttings will be incorporated into the native soils and the site will be reclaimed. Please see attached Remediation and Reclamation Workplan for details.

REMEDATION WORKPLAN (Cont.)

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203
(303)894-2100 Fax: (303)894-2109



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

OGCC Employee: _____

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

Groundwater was not encountered.

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.

Drill cuttings will be incorporated into the native soils and the site will be seeded. Please see attached Remediation and Reclamation Workplan for details.

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:

Please see attached Remediation and Reclamation Workplan for sampling results. Ongoing monitoring of reclamation efforts will be required until COGCC 1000 Series Rules objectives are achieved.

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

On-site incorporation.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 12/23/2015 Date Site Investigation Completed: 1/5/2016 Date Remediation Plan Submitted: 2/19/2016
Remediation Start Date: March 2016 Anticipated Completion Date: June 2016 Actual Completion Date: _____

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

Print Name: Linda Boone Signed: _____

Title: Manager Date: 2/19/2016

OGCC Approved: _____ Title: _____ Date: _____

Conditions of Approval:

- 1) Submit an annual report documenting reclamation work performed and status of vegetation no later than October 31st each year with the following information:
 - a. Total volume of any amendments or fertilizer applied and the application rate per acre;
 - b. Seed mixture and application rate;
 - c. Site photographs depicting the completion of the work including erosion controls and seeding;
 - d. Site photographs depicting the condition of the vegetation during the growing season;
 - e. Copies of the planned bi-annual monitoring inspections referenced in Section 2.6.5 of the Form 27 Attachment;
 - f. Future plans for additional amendments and seeding as needed based on success of the seeding performed in spring 2016.
- 2) Comply with COGCC Rule 1002.f. Stormwater Management throughout the duration of the project.
 - a. Perform and document stormwater inspections after any storm event that results in runoff.
 - b. Verify that stormwater controls are properly maintained or replaced as needed throughout the duration of the project.
- 3) Control noxious weeds throughout the reclamation process. Weed control measures shall be performed in compliance with the Colorado Noxious Weed Act C.R.S. §35-5.5-115.
- 4) If the location is currently used for cattle grazing or will be used during the project, the operator is required to install fencing as needed to protect the reclamation area from damage until vegetation can be established.
- 5) All required work to complete the planned reclamation shall be performed no later than May 31, 2016.
- 6) The reclamation project shall meet closure criteria when all affected areas have a uniform vegetative cover that reflects pre-disturbance area forbs, shrubs and grasses with total percent plant cover of at least eighty percent (80%) of pre-disturbance levels, excluding noxious weeds.
- 7) The operator shall obtain written approval from the Land Owner accepting final reclamation prior to closure of this project. The written approval shall be submitted with the final closure request after closure criteria has been satisfied and all stormwater management controls have been removed.
- 8) COGCC staff will perform a final inspection to verify that the closure criteria have been satisfied after receiving the closure request.

REMEDIATION AND RECLAMATION WORKPLAN

ALOHA MULA #6

LINCOLN COUNTY, COLORADO

FEBRUARY 2016

Prepared for:

**WIEPKING-FULLERTON ENERGY, L.L.C.
Englewood, Colorado**



REMEDIATION AND RECLAMATION WORKPLAN

ALOHA MULA #6 LINCOLN COUNTY, COLORADO

FEBRUARY 2016

Prepared for:

**WIEPKING-FULLERTON ENERGY, L.L.C.
4600 South Downing Street
Englewood, Colorado 80113**

Prepared by:

**LT ENVIRONMENTAL, INC.
4600 West 60th Avenue
Arvada, Colorado 80003
(303) 433-9788**



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APPENDIX C	LANDOWNER APPROVAL
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1.0 INTRODUCTION

On December 3, 2015, the Colorado Oil and Gas Conservation Commission (COGCC) conducted an inspection (Document No. 682600038) to investigate and document suspected surface impacts observed at the Aloha Mula #6 oil and gas location (Site), which is operated by Wiepking-Fullerton Energy, L.L.C. (WFE). During the inspection, it was noted by the COGCC that drilling fluid was released from the drill pad and was not incorporated into native soils resulting in the destruction of existing native grasses and little to no regrowth during the last growing season.

Consequential corrective actions listed on the COGCC inspection report requires WFE to:

- Submit a Form 19 by December 31, 2015;
- Submit a Form 27;
- Conduct confirmation sampling from the pit or “point of release” for COGCC Table 910-1 Concentration Levels;
- Conduct confirmation sampling from residual exploration and production (E&P) waste from native soil at the base of the pit;
- Incorporate residual E&P waste into native soils after COGCC approval; and
- Reclaim the ground surface in accordance with COGCC Rule 1003.

LT Environmental Inc., (LTE) was retained by WFE to assist in the execution of corrective actions assigned to the Site.

A Sundry Notice Form 4 (Document No. 400960966) was submitted and approved on December 30, 2015, verifying the verbal approval by COGCC staff that a Form 19 will not be required to be submitted in response to the COGCC inspection on December 3, 2015. The Sundry Notice Form 4 was submitted as a “Notice of Intent” notifying that a Form 27 will be submitted that will identify necessary remedial work by February 29, 2016. This report is provided as an attachment to the referenced Form 27.

2.0 REMEDIATION AND RECLAMATION WORKPLAN

2.1 BACKGROUND

The COGCC conducted an inspection of the Site on December 3, 2015. During the inspection, it was determined that water-based bentonitic drilling fluids and/or associated cuttings had migrated offsite and impacted approximately 0.46 acres of surrounding vegetation, totaling approximately 62 cubic yards of material.

In response to the COGCC inspection (Document No. 682600038), WFE has prepared this Remediation and Reclamation Workplan, as described in the following sections.

2.2 SITE DESCRIPTION

2.2.1 Location

The Site is located in the southwest quarter of the northeast quarter of Section 19, Township 10 South, Range 55 West, 6th Principal Meridian. The Site is located 2.8 miles south of United States Highway 40 and 0.35 miles west of County Road 26 in Lincoln County, Colorado. The Site Location Map is provided as Figure 1.

2.2.2 Pre-Construction Site Conditions

The land use prior to oil and gas development was rangeland. The terrain was nearly level with native grasses dominating the plant community.

2.2.3 Current Site Conditions

The Site's current land use is rangeland. Total perennial non-invasive plant cover is less than 80 percent (%) of pre-disturbance or reference area vegetation coverage levels, and a portion of the Site has relatively sparse vegetation, creating a non-uniform vegetative cover.

2.3 SOIL SAMPLING ACTIVITIES

2.3.1 Background and Material Sampling

On December 23, 2015, under the direction of WFE, LTE personnel collected one 5-point composite soil sample (SS01) from the surface material visually observed as having accumulated water-based bentonitic drilling fluids and/or associated cuttings. Surface material soil samples were collected, placed on ice, then submitted with a completed chain of custody to Summit Scientific Laboratory (Summit) in Golden, Colorado, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total volatile petroleum hydrocarbons (TVPH)-gasoline range organics (GRO), total extractable petroleum hydrocarbons (TEPH)-diesel range organics (DRO), sodium adsorption ratio (SAR), specific conductivity (EC), and pH.

Additionally, LTE personnel collected four background soil samples (BG01 through BG04) from zero to eight inches below ground surface (bgs). BG01 through BG04 were collected

approximately ten to fifteen feet outside any observed surface disturbance in the four cardinal directions of the Site. Background soil samples were collected, placed on ice, then submitted with a completed chain of custody to Summit for analysis of arsenic, SAR, EC, and pH. Soil sample locations are represented on Figure 2.

2.3.2 Soil Boring Advancement

On January 5, 2016, under the direction of WFE, LTE personnel advanced one soil boring at the release point to evaluate the potential existence of petroleum hydrocarbon impact. The soil boring was advanced using a Geoprobe® rig operated by Elite Drilling Services, L.L.C. of Aurora, Colorado.

The soil boring was logged by an LTE scientist, and the soil was characterized by visual inspection. The total depth of the soil boring was four feet bgs. The soil boring was logged from ground surface to the total depth. There was no visually impacted soil in the soil boring, and groundwater was not encountered. Two discrete soil samples were collected in the soil boring: one sample (RPS01@0-1') from zero to one foot bgs and a second sample (RPS01@3-4') from three feet to four feet bgs.

Soil identified in the soil boring was silty clay from ground surface to three feet bgs and clay loam from three feet bgs to the bottom of the soil bore at four feet bgs.

Samples were collected, placed on ice, then submitted with a completed chain of custody to Summit for analysis of BTEX, TVPH-GRO, TEPH-DRO, SAR, EC, and pH. The soil boring location is represented on Figure 2 and boring log is provided as Appendix A.

2.4 SOIL ANALYTICAL RESULTS

The COGCC Table 910-1 Concentration Levels for benzene, toluene, ethyl-benzene, xylene, TPH, SAR, EC, and pH are 0.17 milligrams per kilogram (mg/kg), 85 mg/kg, 100 mg/kg, 175 mg/kg, 500 mg/kg, 12 units, less than 4 millimhos per centimeter (mmhos/cm) or 2 times background, and 6 to 9 standard units, respectively. Laboratory analytical results indicated all surface material soil samples and soil boring samples were in compliance with applicable COGCC Table 910-1 Concentration Levels with the exception of EC and SAR in soil sample RSP01@0-1' at 4.21 mmhos/cm and 15.3, respectively. Soil analytical results are summarized in Table 1 and the laboratory report is attached as Appendix B.

2.5 REMEDIATION

Following the receipt of the laboratory analytical report, indicating that the native ground potentially impacted with water-based bentonitic drilling fluids and/or soil cuttings was in compliance with COGCC Table 910-1 Concentration Levels except for EC and SAR in soil sample RSP01@0-1' and per prior COGCC approval, WFE will incorporate the water-based bentonitic drilling fluids and/or associated cuttings into the native soil on site via diking methods. Once the material is incorporated, the surface will then be reclaimed in accordance with COGCC 1000 Series Rules to allow a sufficient plant community to re-establish.

Landowner approval allowing incorporation activities is included as Appendix C.

2.6 RECLAMATION ACTION ITEMS

2.6.1 Soil Treatment

Alleviate soil compaction as required by COGCC Rule 1003.c. Rip compacted soil within the release area and any areas of the pad which have not achieved 80% pre-disturbance or reference area levels to a minimum depth of 18 inches bgs, unless bedrock is encountered at a shallower depth. The water-based bentonitic drilling fluids and/or associated cuttings will be incorporated into native soil during the alleviation compaction process.

2.6.2 Seeding

Seed the Site using seeding recommendations provided by the National Resource Conservation Service (NRCS), which includes species consistent with the adjacent rangeland (Appendix D).

2.6.3 Erosion Control

Provide soil stabilization by crimp mulching certified, weed-free grass hay or wheat straw into the seeded areas. Refer to Appendix D for specific recommendations regarding mulch coverage.

2.6.4 Weed Control

Conduct weed mitigation by mowing the Site prior to noxious plants setting seed. Seed setting for noxious weed species in Colorado is typically mid-July through August. More than one mowing event per growing season may be necessary. If chemical weed control is to be utilized, do not apply it during the first growing season.

2.6.5 Monitoring

Monitor the Site bi-annually during the growing season following reclamation activities to identify whether reclamation objectives and standards are likely to be achieved in the near future without additional actions and/or identify actions that are needed to meet the objectives and standards. Monitoring should be done by a qualified vegetation expert using quantitative methods, such as line-point intercept, during the growing season to determine if the site has achieved 80% of pre-disturbance or reference area vegetation coverage levels, excluding undesirable plant species. Documentation of the vegetation monitoring data should be conducted by the qualified vegetation expert, demonstrating the vegetation levels meet the 80% objective.

Special attention should be given to the monitoring of undesirable species or noxious weeds for prompt control if necessary. Additional actions to achieve final reclamation is contingent on monitoring results.

2.7 NO FURTHER ACTION REQUEST

Once remediation and reclamation actions have been completed, WFE will submit a final report detailing the work conducted in response to the COGCC inspection report (Document No. 682600038) and to request No Further Action (NFA).

FIGURES

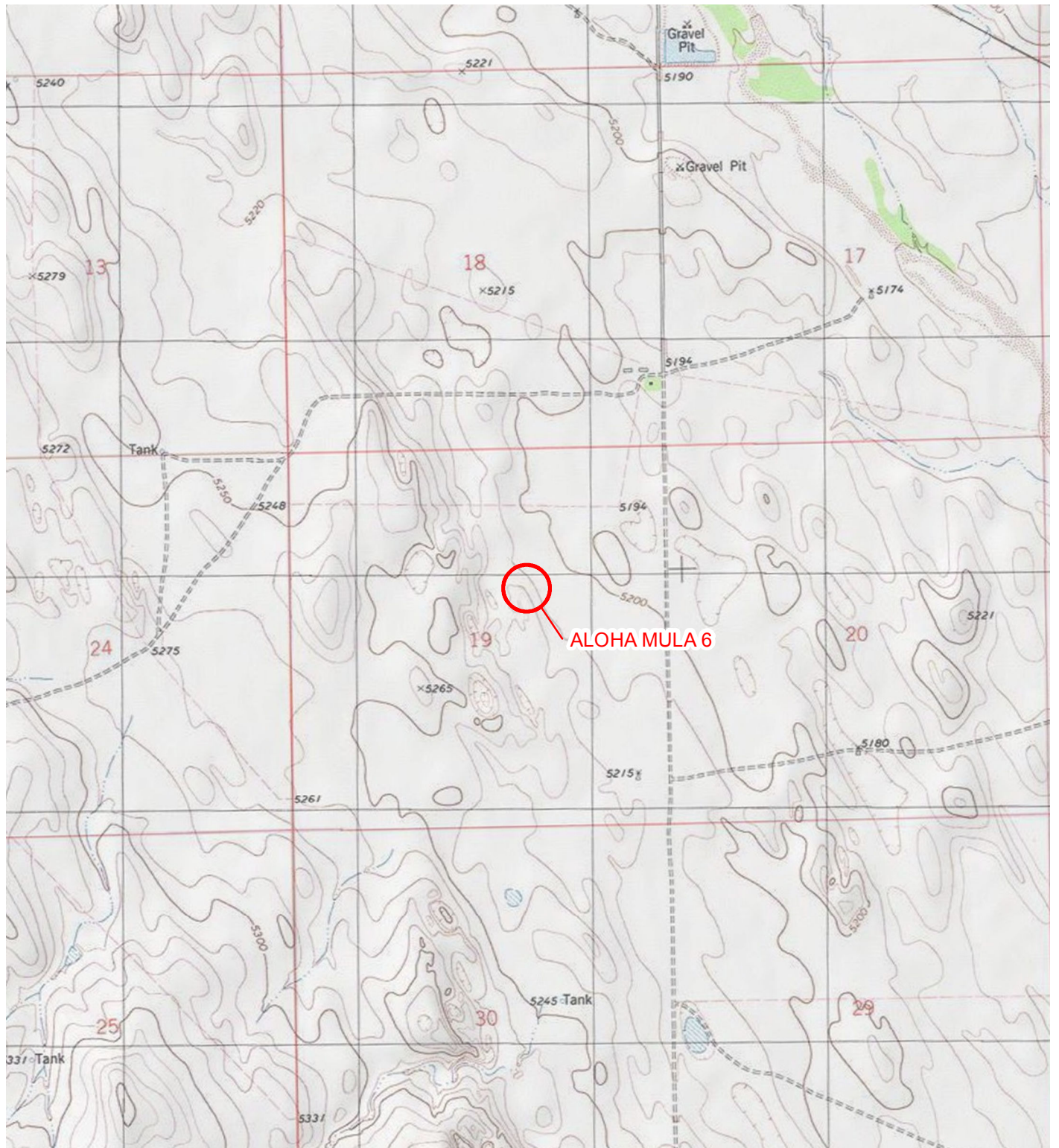
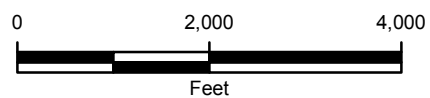


IMAGE COURTESY OF ESRI/USGS

LEGEND

○ SITE LOCATION



COLORADO

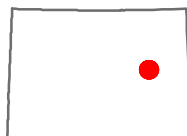


FIGURE 1
SITE LOCATION MAP
ALOHA MULA 6
LINCOLN COUNTY, COLORADO

WIEPKING-FULLERTON ENERGY, L.L.C.



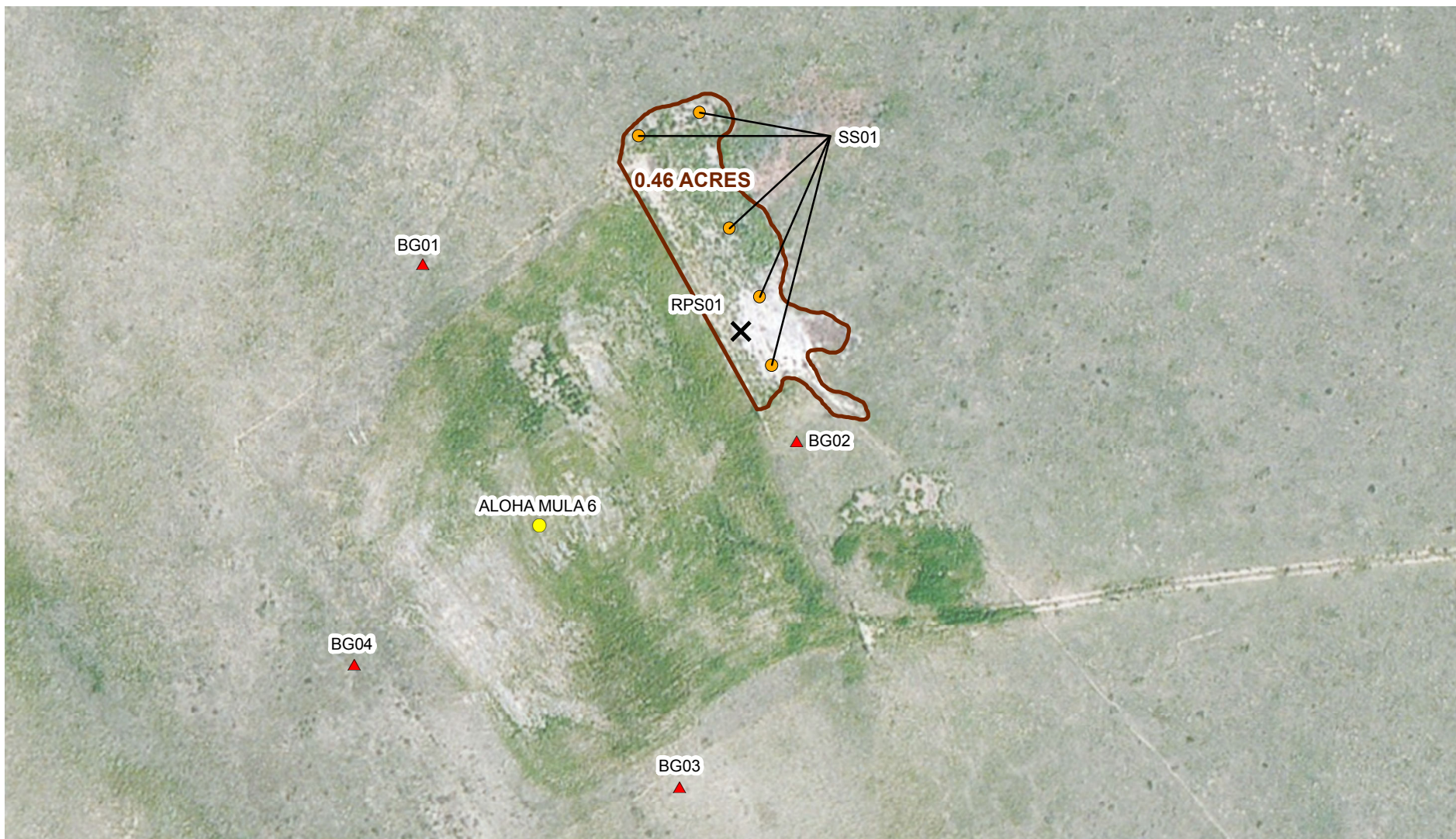


IMAGE COURTESY OF ESRI

LEGEND

- WELLHEAD
- ▭ DRILLING FLUID RELEASE AREA
- X RELEASE POINT SAMPLE
- DRILLING FLUID COMPOSITE SOIL SAMPLE 1
- ▲ BACKGROUND SOIL SAMPLE

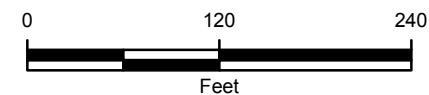


FIGURE 2
SITE MAP
ALOHA MULA 6
LINCOLN COUNTY, COLORADO

WIEPKING-FULLERTON ENERGY, L.L.C.



TABLES

TABLE 1
SOIL ANALYTICAL RESULTS
ALOHA MULA #6
LINCOLN COUNTY, COLORADO
WIEPKING-FULLERTON ENERGY

Parameter	COGCC Table 910-1 Concentration Levels	Units	BG01	BG02	BG03	BG04	SS01	RPS01@0-1'	RPS01@3-4'
Sample Date			12/23/2015	12/23/2015	12/23/2015	12/23/2015	12/23/2015	1/5/2016	1/5/2016
Sample Type			Background	Background	Background	Background	Drill Cuttings	Release Point	Release Point
Depth (feet bgs)			0 - 0.67	0 - 0.67	0 - 0.67	0 - 0.67	0 - 0.67	0 - 1	3 - 4
Benzene	0.17	mg/kg	--	--	--	--	<0.002	<0.0018	<0.0017
Toluene	85	mg/kg	--	--	--	--	<0.0050	<0.0044	<0.0043
Ethylbenzene	100	mg/kg	--	--	--	--	<0.0050	<0.0044	<0.0043
Total Xylenes	175	mg/kg	--	--	--	--	<0.0050	<0.0044	<0.0043
TEPH-DRO	--	mg/kg	--	--	--	--	<50	<50.0	<50.0
TVPH-GRO	--	mg/kg	--	--	--	--	<0.50	<0.44	<0.43
TPH Total	500	mg/kg	--	--	--	--	<50.50	<50.44	<50.43
Arsenic	0.39	mg/kg	1.01	1.32	1.33	1.24	--	--	--
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	0.144	0.157	0.178	0.137	1.05	4.21	0.289
pH	6 - 9	SU	7.11	7.04	7.77	7.38	7.01	7.31	7.47
SAR	12	unitless	0.302	0.182	0.442	0.494	0.127	15.3	0.670

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

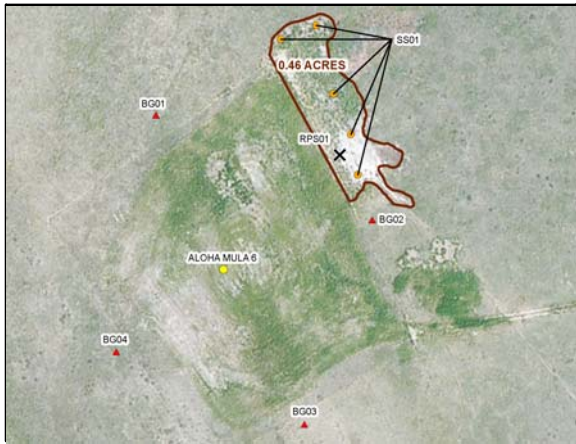
TPH - total petroleum hydrocarbons

-- - not analyzed/no standard

< - less than the stated analytical reporting limit



APPENDIX A
BORING LOG



Compliance • Engineering • Remediation
LT Environmental, Inc.
 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME: Aloha Mula #6

PROJECT NO.: 050114002

BORING/WELL ID.: RPS01

COMPLETION DATE: 1/5/2016

TD (ft bgs):

4'

DTW (ft bgs):

NA

LOGGED BY: William Baldwin

SAMPLE MTHD: Continuous

DRILL MTHD: Direct Push

DRILLED BY: Elite Drilling

DETECTOR: UltraRae 3000

HOLE DIAMETER.: 2.25"

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description
No Observed Impacts		Moist	RPS01 @ 0-1'		0	SM		Bentonite: Less than 1" bentonitic mud on surface SM: 1"-4' - light brown, loose, SAND, silty, dry, no hydrocarbon stain, no hydrocarbon odor
			RPS01 @ 3-4'		4/4			

APPENDIX B
LABORATORY ANALYTICAL REPORT



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

January 04, 2016

Brett Forkner

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: Wiepking-Fullerton Energy, Aloha Mula #6

Enclosed are the results of analyses for samples received by Summit Scientific on 12/24/15 10:00. 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: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BG01	1512204-01	Soil	12/23/15 11:00	12/24/15 10:00
BG02	1512204-02	Soil	12/23/15 11:05	12/24/15 10:00
BG03	1512204-03	Soil	12/23/15 11:10	12/24/15 10:00
BG04	1512204-04	Soil	12/23/15 11:15	12/24/15 10:00
SS01	1512204-05	Soil	12/23/15 11:30	12/24/15 10:00

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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG01
1512204-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 12/23/15 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.01	0.106	mg/kg dry	1	1512224	12/28/15	12/29/15	EPA 6020A	

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

Date Sampled: 12/23/15 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	2960	8.79	mg/kg dry	1	1512228	12/28/15	12/29/15	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	1410	4.40	"	"	"	"	"	"	
Sodium	79.8	4.40	"	"	"	"	"	"	

Date Sampled: 12/23/15 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.302		units	"	1512279	12/31/15	12/31/15	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.144	0.0100	mmhos/cm	1	1512235	12/28/15	12/29/15	SM 2510B	

Date Sampled: 12/23/15 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.11	0.100	pH Units	"	1512234	12/28/15	12/29/15	EPA 9045	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG01
1512204-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	94.0		%	1	1512248	12/29/15	12/30/15	% calculation	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG02
1512204-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 12/23/15 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.32	0.109	mg/kg dry	1	1512224	12/28/15	12/29/15	EPA 6020A	

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

Date Sampled: 12/23/15 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	157	10.9	mg/kg dry	1	1512228	12/28/15	12/28/15	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	69.2	5.47	"	"	"	"	"	"	
Sodium	10.9	5.47	"	"	"	"	"	"	

Date Sampled: 12/23/15 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.182		units	"	1512279	12/31/15	12/31/15	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.157	0.0100	mmhos/cm	1	1512235	12/28/15	12/29/15	SM 2510B	

Date Sampled: 12/23/15 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.04	0.100	pH Units	"	1512234	12/28/15	12/29/15	EPA 9045	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG02
1512204-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	91.4		%	1	1512248	12/29/15	12/30/15	% calculation	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG03
1512204-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 12/23/15 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.33	0.107	mg/kg dry	1	1512224	12/28/15	12/29/15	EPA 6020A	

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

Date Sampled: 12/23/15 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	86.4	8.70	mg/kg dry	1	1512228	12/28/15	12/28/15	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	44.5	4.35	"	"	"	"	"	"	
Sodium	20.3	4.35	"	"	"	"	"	"	

Date Sampled: 12/23/15 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.442		units	"	1512279	12/31/15	12/31/15	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.178	0.0100	mmhos/cm	1	1512235	12/28/15	12/29/15	SM 2510B	

Date Sampled: 12/23/15 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.77	0.100	pH Units	"	1512234	12/28/15	12/29/15	EPA 9045	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG03
1512204-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	93.1		%	1	1512248	12/29/15	12/30/15	% calculation	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG04
1512204-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 12/23/15 11:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	1.24	0.106	mg/kg dry	1	1512224	12/28/15	12/29/15	EPA 6020A	

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

Date Sampled: 12/23/15 11:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	116	9.55	mg/kg dry	1	1512228	12/28/15	12/28/15	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	49.2	4.77	"	"	"	"	"	"	
Sodium	25.2	4.77	"	"	"	"	"	"	

Date Sampled: 12/23/15 11:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.494		units	"	1512279	12/31/15	12/31/15	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.137	0.0100	mmhos/cm	1	1512235	12/28/15	12/29/15	SM 2510B	

Date Sampled: 12/23/15 11:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.38	0.100	pH Units	"	1512234	12/28/15	12/29/15	EPA 9045	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

BG04
1512204-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	94.2		%	1	1512248	12/29/15	12/30/15	% calculation	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

SS01
1512204-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1512232	12/28/15	12/29/15	8015M	

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		100 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1512230	12/28/15	12/29/15	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.1 %	21-167		"	"	"	"	

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

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

SS01
1512204-05 (Soil)

Summit Scientific

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

Calcium	2590	8.95 mg/kg dry	1	1512228	12/28/15	12/28/15	EPA 6020/Mod. USDA60 6(2, 3A)
Magnesium	303	4.48	"	"	"	"	"
Sodium	25.7	4.48	"	"	"	"	"

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.127		units	"	1512279	12/31/15	12/31/15	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.05	0.0100	mmhos/cm	1	1512235	12/28/15	12/29/15	SM 2510B	

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.01	0.100	pH Units	"	1512234	12/28/15	12/29/15	EPA 9045	

Date Sampled: 12/23/15 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	90.8		%	"	1512248	12/29/15	12/30/15	% calculation	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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 1512232 - EPA 3550A

Blank (1512232-BLK1)

Prepared: 12/28/15 Analyzed: 12/29/15

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 11.6 " 12.5 92.4 30-150

LCS (1512232-BS1)

Prepared: 12/28/15 Analyzed: 12/29/15

C10-C28 (DRO) 521 50 mg/kg 499 104 73-134

Surrogate: o-Terphenyl 11.7 " 12.5 93.6 30-150

Matrix Spike (1512232-MS1)

Source: 1512204-05

Prepared: 12/28/15 Analyzed: 12/29/15

C10-C28 (DRO) 520 50 mg/kg 499 16.8 101 50-148

Surrogate: o-Terphenyl 11.8 " 12.5 94.7 30-150

Matrix Spike Dup (1512232-MSD1)

Source: 1512204-05

Prepared: 12/28/15 Analyzed: 12/29/15

C10-C28 (DRO) 536 50 mg/kg 497 16.8 104 50-148 3.01 13

Surrogate: o-Terphenyl 12.2 " 12.5 98.1 30-150

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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

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

Batch 1512230 - EPA 5030 Soil MS

Blank (1512230-BLK1)

Prepared & Analyzed: 12/28/15

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	21-167			

LCS (1512230-BS1)

Prepared & Analyzed: 12/28/15

Benzene	0.0846	0.0020	mg/kg	0.100		84.6	58-130			
Toluene	0.0836	0.0050	"	0.100		83.6	61-134			
Ethylbenzene	0.0919	0.0050	"	0.0992		92.6	74-139			
m,p-Xylene	0.168	0.010	"	0.200		83.9	73-137			
o-Xylene	0.0871	0.0050	"	0.0984		88.5	73-141			
Xylenes (total)	0.255	0.0050	"				30-150			
Gasoline Range Hydrocarbons	1.76	0.50	"				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0385		"	0.0400		96.2	23-173			
Surrogate: Toluene-d8	0.0438		"	0.0400		110	20-170			
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		97.0	21-167			

Matrix Spike (1512230-MS1)

Source: 1512208-05

Prepared & Analyzed: 12/28/15

Benzene	0.0882	0.0020	mg/kg	0.0962	ND	91.7	30-131			
Toluene	0.0861	0.0050	"	0.0962	ND	89.5	30-134			
Ethylbenzene	0.101	0.0050	"	0.0954	ND	105	22-153			
m,p-Xylene	0.183	0.010	"	0.192	ND	95.5	10-159			
o-Xylene	0.0952	0.0050	"	0.0946	ND	101	31-151			
Xylenes (total)	0.279	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	1.98	0.50	"		ND		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0391		"	0.0385		102	23-173			
Surrogate: Toluene-d8	0.0404		"	0.0385		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0366		"	0.0385		95.3	21-167			

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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 1512230 - EPA 5030 Soil MS

Matrix Spike Dup (1512230-MSD1)	Source: 1512208-05			Prepared: 12/28/15		Analyzed: 12/29/15				
Benzene	0.0913	0.0020	mg/kg	0.0945	ND	96.6	30-131	3.45	34	
Toluene	0.0890	0.0050	"	0.0945	ND	94.2	30-134	3.38	30	
Ethylbenzene	0.108	0.0050	"	0.0938	ND	115	22-153	7.19	24	
m,p-Xylene	0.198	0.010	"	0.189	ND	105	10-159	7.56	68	
o-Xylene	0.103	0.0050	"	0.0930	ND	111	31-151	8.36	38	
Xylenes (total)	0.301	0.0050	"		ND		30-150	7.83	20	
Gasoline Range Hydrocarbons	2.23	0.50	"		ND		30-150	11.7	20	
Surrogate: 1,2-Dichloroethane-d4	0.0395		"	0.0378		104	23-173			
Surrogate: Toluene-d8	0.0377		"	0.0378		99.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0366		"	0.0378		96.7	21-167			

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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 1512224 - EPA 3050B

LCS (1512224-BS1)

Prepared: 12/28/15 Analyzed: 12/29/15

Arsenic	103	0.250	mg/kg wet	111	92.3	62.3-117
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Duplicate (1512224-DUP1)

Source: 1512195-01

Prepared: 12/28/15 Analyzed: 12/29/15

Arsenic	2.60	0.117	mg/kg dry	2.92	11.7	20
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Matrix Spike (1512224-MS1)

Source: 1512195-01

Prepared: 12/28/15 Analyzed: 12/29/15

Arsenic	43.1	0.117	mg/kg dry	44.7	2.92	89.8	75-125
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Matrix Spike Dup (1512224-MSD1)

Source: 1512195-01

Prepared: 12/28/15 Analyzed: 12/29/15

Arsenic	38.6	0.117	mg/kg dry	43.4	2.92	82.3	75-125	10.9	25
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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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 1512228 - General Preparation

Blank (1512228-BLK1)

Prepared & Analyzed: 12/28/15

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

LCS (1512228-BS1)

Prepared & Analyzed: 12/28/15

Calcium	531	10.0	mg/kg wet	500	106	82.9-118
Magnesium	558	5.00	"	500	112	77.1-123
Sodium	578	5.00	"	500	116	71-129

Duplicate (1512228-DUP1)

Source: 1512204-01

Prepared & Analyzed: 12/28/15

Calcium	101	8.79	mg/kg dry	2960	187	200
Magnesium	55.1	4.40	"	1410	185	200
Sodium	78.0	4.40	"	79.8	2.23	200

Matrix Spike (1512228-MS1)

Source: 1512204-01

Prepared & Analyzed: 12/28/15

Calcium	534	8.79	mg/kg dry	440	2960	NR	75-125	QM-07
Magnesium	581	4.40	"	440	1410	NR	75-125	QM-07
Sodium	541	4.40	"	440	79.8	105	75-125	

Matrix Spike Dup (1512228-MSD1)

Source: 1512204-01

Prepared & Analyzed: 12/28/15

Calcium	545	8.79	mg/kg dry	440	2960	NR	75-125	2.00	25	QM-07
Magnesium	563	4.40	"	440	1410	NR	75-125	3.23	25	QM-07
Sodium	535	4.40	"	440	79.8	104	75-125	1.13	25	

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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 1512234 - General Preparation

LCS (1512234-BS1) Prepared: 12/28/15 Analyzed: 12/29/15

pH	8.02	0.100	pH Units	8.00	100	95-105
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Duplicate (1512234-DUP1) Source: 1512204-01 Prepared: 12/28/15 Analyzed: 12/29/15

pH	7.30	0.100	pH Units	7.11	2.62	20
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Batch 1512235 - General Preparation

Blank (1512235-BLK1) Prepared: 12/28/15 Analyzed: 12/29/15

Specific Conductance (EC)	ND	0.0100	mmhos/cm
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LCS (1512235-BS1) Prepared: 12/28/15 Analyzed: 12/29/15

Specific Conductance (EC)	0.497	0.0100	mmhos/cm	0.500	99.4	90-110
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Duplicate (1512235-DUP1) Source: 1512204-01 Prepared: 12/28/15 Analyzed: 12/29/15

Specific Conductance (EC)	0.0900	0.0100	mmhos/cm	0.144	46.0	20	QR-03
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Batch 1512248 - General Preparation

Duplicate (1512248-DUP1) Source: 1512195-01 Prepared: 12/29/15 Analyzed: 12/30/15

% Solids	85.8		%	85.4	0.467	20
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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: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114001
Project Manager: Brett Forkner

Reported:
01/04/16 13:05

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

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

January 12, 2016

Brett Forkner

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: Wiepking-Fullerton Energy, Aloha Mula #6

Enclosed are the results of analyses for samples received by Summit Scientific on 01/06/16 11:30. 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: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RPS01@0-1'	1601035-01	Soil	01/05/16 11:00	01/06/16 11:30
RPS01@3-4'	1601035-02	Soil	01/05/16 11:10	01/06/16 11:30

Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

RPS01@0-1'
1601035-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1601063	01/08/16	01/09/16	8015M	

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		84.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0018	mg/kg	1	1601061	01/08/16	01/08/16	EPA 8260B	
Toluene	ND	0.0044	"	"	"	"	"	"	
Ethylbenzene	ND	0.0044	"	"	"	"	"	"	
Xylenes (total)	ND	0.0044	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.44	"	"	"	"	"	"	

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.9 %	21-167		"	"	"	"	

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

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

RPS01@0-1'
1601035-01 (Soil)

Summit Scientific

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

Calcium	212	9.05 mg/kg dry	1	1601059	01/08/16	01/08/16	EPA 6020/Mod. USDA60 6(2, 3A)
Magnesium	36.8	4.53	"	"	"	"	"
Sodium	918	4.53	"	"	"	"	"

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	15.3		units	"	1601076	01/11/16	01/11/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	4.21	0.0100 mmhos/cm		1	1601018	01/07/16	01/07/16	SM 2510B	

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.31	0.100 pH Units		"	1601017	01/07/16	01/07/16	EPA 9045	

Date Sampled: 01/05/16 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	98.6		%	"	1601045	01/07/16	01/08/16	% 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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

RPS01@3-4'
1601035-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1601063	01/08/16	01/09/16	8015M	

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		87.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0017	mg/kg	1	1601061	01/08/16	01/08/16	EPA 8260B	
Toluene	ND	0.0043	"	"	"	"	"	"	
Ethylbenzene	ND	0.0043	"	"	"	"	"	"	
Xylenes (total)	ND	0.0043	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.43	"	"	"	"	"	"	

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.6 %	21-167		"	"	"	"	

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

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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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: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

RPS01@3-4'
1601035-02 (Soil)

Summit Scientific

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

Calcium	119	8.07	mg/kg dry	1	1601059	01/08/16	01/08/16	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	27.0	4.03	"	"	"	"	"	"	
Sodium	31.1	4.03	"	"	"	"	"	"	

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.670		units	"	1601076	01/11/16	01/11/16	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.289	0.0100	mmhos/cm	1	1601018	01/07/16	01/07/16	SM 2510B	

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.47	0.100	pH Units	"	1601017	01/07/16	01/07/16	EPA 9045	

Date Sampled: 01/05/16 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	97.9		%	"	1601045	01/07/16	01/08/16	% 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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

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 1601063 - EPA 3550A

Blank (1601063-BLK1)

Prepared: 01/08/16 Analyzed: 01/09/16

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 10.6 " 12.5 85.0 30-150

LCS (1601063-BS1)

Prepared: 01/08/16 Analyzed: 01/09/16

C10-C28 (DRO) 505 50 mg/kg 499 101 73-134

Surrogate: o-Terphenyl 10.9 " 12.5 87.6 30-150

Matrix Spike (1601063-MS1)

Source: 1601032-21

Prepared: 01/08/16 Analyzed: 01/09/16

C10-C28 (DRO) 608 50 mg/kg 499 44.4 113 50-148

Surrogate: o-Terphenyl 11.8 " 12.5 94.2 30-150

Matrix Spike Dup (1601063-MSD1)

Source: 1601032-21

Prepared: 01/08/16 Analyzed: 01/09/16

C10-C28 (DRO) 584 50 mg/kg 499 44.4 108 50-148 4.08 13

Surrogate: o-Terphenyl 11.1 " 12.5 88.8 30-150

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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

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

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

Batch 1601061 - EPA 5030 Soil MS

Blank (1601061-BLK1)

Prepared & Analyzed: 01/08/16

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	0.0430		"	0.0400		107	23-173			
Surrogate: Toluene-d8	0.0374		"	0.0400		93.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0405		"	0.0400		101	21-167			

LCS (1601061-BS1)

Prepared & Analyzed: 01/08/16

Benzene	0.103	0.0020	mg/kg	0.100		103	58-130			
Toluene	0.102	0.0050	"	0.100		102	61-134			
Ethylbenzene	0.127	0.0050	"	0.0992		128	74-139			
m,p-Xylene	0.229	0.010	"	0.200		114	73-137			
o-Xylene	0.113	0.0050	"	0.0984		115	73-141			
Xylenes (total)	0.341	0.0050	"				30-150			
Gasoline Range Hydrocarbons	2.70	0.50	"				30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0400		107	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0375		"	0.0400		93.7	21-167			

Matrix Spike (1601061-MS1)

Source: 1601032-21

Prepared: 01/08/16 Analyzed: 01/09/16

Benzene	0.0993	0.0020	mg/kg	0.0982	ND	101	30-131			
Toluene	0.102	0.0050	"	0.0982	0.00426	99.1	30-134			
Ethylbenzene	0.121	0.0050	"	0.0974	ND	124	22-153			
m,p-Xylene	0.214	0.010	"	0.196	ND	109	10-159			
o-Xylene	0.109	0.0050	"	0.0967	0.00408	109	31-151			
Xylenes (total)	0.323	0.0050	"		0.00408		30-150			
Gasoline Range Hydrocarbons	ND	0.50	"		2.25		30-150			
Surrogate: 1,2-Dichloroethane-d4	0.0429		"	0.0393		109	23-173			
Surrogate: Toluene-d8	0.0392		"	0.0393		99.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0393		98.6	21-167			

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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

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 1601061 - EPA 5030 Soil MS

Matrix Spike Dup (1601061-MSD1)	Source: 1601032-21			Prepared: 01/08/16		Analyzed: 01/09/16				
Benzene	0.104	0.0020	mg/kg	0.0994	ND	104	30-131	4.46	34	
Toluene	0.105	0.0050	"	0.0994	0.00426	101	30-134	2.88	30	
Ethylbenzene	0.130	0.0050	"	0.0986	ND	132	22-153	7.06	24	
m,p-Xylene	0.228	0.010	"	0.198	ND	115	10-159	6.41	68	
o-Xylene	0.117	0.0050	"	0.0978	0.00408	115	31-151	6.46	38	
Xylenes (total)	0.345	0.0050	"		0.00408		30-150	6.43	20	
Gasoline Range Hydrocarbons	ND	0.50	"		2.25		30-150		20	
Surrogate: 1,2-Dichloroethane-d4	0.0441		"	0.0398		111	23-173			
Surrogate: Toluene-d8	0.0392		"	0.0398		98.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0380		"	0.0398		95.5	21-167			

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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

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 1601059 - General Preparation

Blank (1601059-BLK1)

Prepared & Analyzed: 01/08/16

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

LCS (1601059-BS1)

Prepared & Analyzed: 01/08/16

Calcium	553	10.0	mg/kg wet	500	111	82.9-118
Magnesium	559	5.00	"	500	112	77.1-123
Sodium	544	5.00	"	500	109	71-129

Duplicate (1601059-DUP1)

Source: 1601034-01

Prepared & Analyzed: 01/08/16

Calcium	725	8.66	mg/kg dry	688	5.24	200
Magnesium	106	4.33	"	113	5.95	200
Sodium	8.56	4.33	"	12.9	40.7	200

Matrix Spike (1601059-MS1)

Source: 1601034-01

Prepared & Analyzed: 01/08/16

Calcium	1150	8.66	mg/kg dry	433	688	107	75-125
Magnesium	580	4.33	"	433	113	108	75-125
Sodium	471	4.33	"	433	12.9	106	75-125

Matrix Spike Dup (1601059-MSD1)

Source: 1601034-01

Prepared & Analyzed: 01/08/16

Calcium	1190	8.66	mg/kg dry	433	688	117	75-125	3.68	25
Magnesium	600	4.33	"	433	113	112	75-125	3.41	25
Sodium	490	4.33	"	433	12.9	110	75-125	4.01	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: Wiepking-Fullerton Energy, Aloha Mula #6
Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

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 1601017 - General Preparation

LCS (1601017-BS1)					Prepared & Analyzed: 01/05/16						
pH	8.06	0.100	pH Units	8.00	101	95-105					
Duplicate (1601017-DUP1)					Source: 1601012-02 Prepared & Analyzed: 01/05/16						
pH	8.15	0.100	pH Units	8.15				0.00	20		

Batch 1601018 - General Preparation

Blank (1601018-BLK1)					Prepared & Analyzed: 01/05/16						
Specific Conductance (EC)	ND	0.0100	mmhos/cm								
LCS (1601018-BS1)					Prepared & Analyzed: 01/05/16						
Specific Conductance (EC)	0.489	0.0100	mmhos/cm	0.500	97.9	90-110					
Duplicate (1601018-DUP1)					Source: 1601012-02 Prepared & Analyzed: 01/05/16						
Specific Conductance (EC)	0.270	0.0100	mmhos/cm	0.263				2.44	20		

Batch 1601045 - General Preparation

Duplicate (1601045-DUP1)					Source: 1601038-02 Prepared: 01/07/16 Analyzed: 01/08/16						
% Solids	96.3		%	96.2				0.0657	20		

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: Wiepking-Fullerton Energy, Aloha Mula #6

Project Number: 50114002
Project Manager: Brett Forkner

Reported:
01/12/16 14:04

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

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.

A handwritten signature in black ink, appearing to be 'MSM'.

APPENDIX C
LANDOWNER APPROVAL



February 12, 2016

**RE: Final Reclamation Landowner Notification and Approval
Wiepking-Fullerton Energy, L.L.C.
Aloha Mula 6
Lincoln County, Colorado**

Dear Mr. Forristall:

The Colorado Oil and Gas Conservation Commission (COGCC) Rule 306.e.(f) requires Wiepking-Fullerton Energy, L.L.C. to inform the Landowner of anticipated final reclamation activities at the above referenced location.

Objective

The objectives of final surface reclamation is to return the land, following use for energy development, to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, ecological function and other natural resource values to maintain healthy, biologically active topsoil; to control erosion and sediment transport; and to minimize loss of habitat, forage, and visual resources. Surface reclamation will be judged successful when disturbed areas have been re-contoured, stabilized, and re-vegetated with a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community sufficient to minimize visual impacts, provide forage, stabilize soils, and impede the invasion of noxious weeds.

Surface Reclamation Plan

The site-specific Remediation and Reclamation Work Plan for the above referenced site is attached as Attachment A.

Schedule of Activities

Remediation and reclamation activities are scheduled to commence in March 2016 and to be completed no later than May 31st, 2016, weather permitting.

Signature

If you agree with the activities identified in the Remediation and Reclamation Work Plan, please sign below. If you have any additional comments as to the schedule of the activities, seed mix to be used, or final land use, please use Attachment B to do so.

Landowner Name (Print): Forristall Ranch Inc.

Landowner Signature: Forristall Ranch Inc. by John Forristall Date: 2/18/16

APPENDIX D
NRCS SEED MIX RECOMMENDATIONS



**Grass Seeding: PART I - Planned**

Planner:	Aaron Reynolds			Date:	3-Feb-15	
Producer:	Aloha Mula 6					
MLRA:	Loamy Sand	Contract/Agreement #:			Item Num:	
Seeding Operation:	Acres to be seeded:	4		Cropland:	non-irrigated	
	Seedbed Prep:			Drill Type:	grass	
	Planting Dates:	Nov 1 to May 1		Drill Spacing (in.):	10	
	Planting Depth (in.):	1/4 to 1/2 inch				
Fertilizer:	Pounds per acre recommended			<i>(requires completion of 590 Job Sheet)</i>		
	Nitrogen (N)	Phosphorus (P)	Potassium (K)			
Weed Control:	Dates:			<i>(requires completion of 595 Job Sheet)</i>		
	Description:					
Cover:	Amount:					
	Description:					
	Application Method:					

Seed Recommendations:

Species	Variety (table 6: PMTN 59)	PLS Rates Irr/Non-Irr	PLS/Ac to use (100%)	% in mix	Rate (PLS lb/ac)	Acres to be seeded	Total PLS
Sand bluestem	Elida, Woodward, Garden	16.0 / 8.0	16.0	20	3.2	4.0	12.8
Sideoats grama	El Reno, Niner, Vaughn	9.0 / 4.5	9.0	20	1.8	4.0	7.2
Yellow indiangrass	Liano, Cheyenne, Holt	10.0 / 5.0	10.0	20	2.0	4.0	8.0
Prairie sandreed	Goshen	6.5 / 3.5	6.5	20	1.3	4.0	5.2
Switchgrass	Blackwell, NE 28, Pathefinder	4.0 / 2.0	4.0	15	0.6	4.0	2.4
Yellow sweetclover		7.0 / 3.5	7.0	5	0.4	4.0	1.4

Totals

52.5

100.0

9.3

4.0

37.0

**Other Seeding
Information and
Rates:**

Critical area seeding recommendation per acre, area should have no slopes greater than 3:1, mulched with weed free native grass hay or wheat straw, livestock excluded for 2 years

Notes: Use adapted improved varieties and cultivars in the following order of preference, when available:

1. certified name varieties, 2. named varieties, 3. common seed

PLS = Pure Live Seed

Double drilled seeding rate to obtain broadcast seeding rate.

Certified Planner: Scott Smith

Date: 2/3/2015