



April 23, 2014

Mr. Robert Young  
Northeast Region Environmental Protection Specialist  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, Colorado 80203

**RE: Semi-Annual Monitoring Report  
Wright Oil Skim Pit Material Landfarm  
Facility ID: 107607  
API – 121-05259  
Remediation #7368  
SWSW Sec. 31 T3S R53W, 6<sup>th</sup> Principal Meridian  
Washington County, Colorado**

Dear Mr. Young:

LT Environmental, Inc. (LTE), under the direction of the Beren Corporation (Beren), conducted soil monitoring at the Beren Wright Landfarm (Site). The Site is located approximately 2.04 miles southeast of the town of Lindon, Washington County, Colorado, and 0.22 miles north-northeast of the intersection of County Road (CR) U and Highway 36 (Figure 1). This correspondence is provided as the *2015 Semi-annual Monitoring Report* and summarizes soil monitoring activities conducted at the Site from October 2014 through April 2015.

### **Landfarm Description**

The Site is located on grassland to the north and west of the former oil skim pit at the Wright Tank Battery where Beren and the landowner have agreed to remediate petroleum hydrocarbon-impacted soil identified at the Site during pit-closure activities conducted in October 2012. Approximately 100 cubic yards of impacted soil was applied in July 2013 at the Site per the Colorado Oil and Gas Conservation Commission (COGCC) Rule 907 (d) (3) and the COGCC approved *E&P Waste Management Plan* (December 2012). The impacted soil was thoroughly mixed and spread approximately 12 inches thick by Beren contractors on the landfarm cell. Ditch and berm stormwater controls were installed around the perimeter of the landfarm cell to ensure sediment from the landfarming activities is kept on site and runoff does not migrate onto the surrounding grassland.

### **Landfarm Maintenance**

On February 8, 2015, the soil was disked for aeration. Manure was applied after the sampling event (See Summary).

### **Soil Sampling Procedures**

On March 31, 2015, LTE, under the direction of Beren, one, five-point composite soil sample (Comp01) was collected from a depth of 0.0 to 12 inches below ground surface (bgs). The sample ID was based on its corresponding landfarm cell values (i.e. Comp01 was collected in cell 1). The sampling was



done in accordance with the COGCC Waste Management plan Conditions of Approval Letter dated January 30, 2013. Soil sample locations are depicted on Figure 2.

The composite soil samples were submitted to Summit Scientific Laboratory in Golden, Colorado, for analysis of total petroleum hydrocarbons (TPH)-diesel range organics (DRO) by United States Environmental Protection Agency (EPA) Modified Method 8015. Analytes selected for laboratory analysis were based on contaminant of concern screening through the collection of four worst-case discreet grab samples from stockpiled soil prior to landfarming, as directed by the COGCC in the Conditions of Approval Letter, dated January 30, 2013.

### **Soil Sampling Results**

One composite soil samples were collected at the Site on March 31, 2015, and submitted for laboratory analysis to monitor the progress of landfarming to remediate the impacted soil. Laboratory analytical results indicate TPH-DRO concentration of 7,700 milligrams per kilogram (mg/kg) in soil sample Comp01 exceeded the COGCC Table 910-1 Concentration Levels for TPH in soil of 500 mg/kg. Laboratory analytical results are summarized in Table 1. The laboratory analytical report is included as Attachment A.

### **Summary and Conclusions**

LTE, on behalf of Beren, collected one composite soil sample which was submitted for laboratory analysis. The composite soil sample laboratory results indicated that concentration of TPH-DRO exceeded COGCC Table 910-1 Concentration Level.

As of the time of this report, sampling has been conducted to collect data to aid in the design of a manure/fertilizer blend to maximize the biological remediation potential of the landfarm. It was determined that the landfarms were deficient in both moisture and nitrogen. As such, 12 cubic yards of chicken manure (for the addition of bacteria) and approximately 400 lbs of hay were added (for bulking of the soil to encourage biologic activity) and were tilled/disked into the soil. An increased schedule of disking and moisturization has been implemented (at a minimum of every two weeks) to take advantage of the warm months ahead. LTE and Beren also have plans to increase the frequency of sampling the landfarm with intention to close cells expeditiously following passing results. The COGCC requires that landfarm activities be completed and the site reclamation to be underway by October 31, 2015. LTE and Beren will be working diligently over the next 6 months to accomplish this goal.



Please call us at 303-433-9788 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to be "EL", with a horizontal line extending to the right.

Eric Lang, P.G.  
Staff Geologist

A handwritten signature in black ink, appearing to be "C. Purcell", with a vertical line at the end.

Chris Purcell, C.P.G.  
Client Manager/Project Geologist

Attachments:

|              |                              |
|--------------|------------------------------|
| Figure 1     | Site Location Map            |
| Figure 2     | Site Map                     |
| Table 1      | Soil Analytical Results      |
| Attachment A | Photolog                     |
| Attachment B | Laboratory Analytical Report |

**FIGURE**



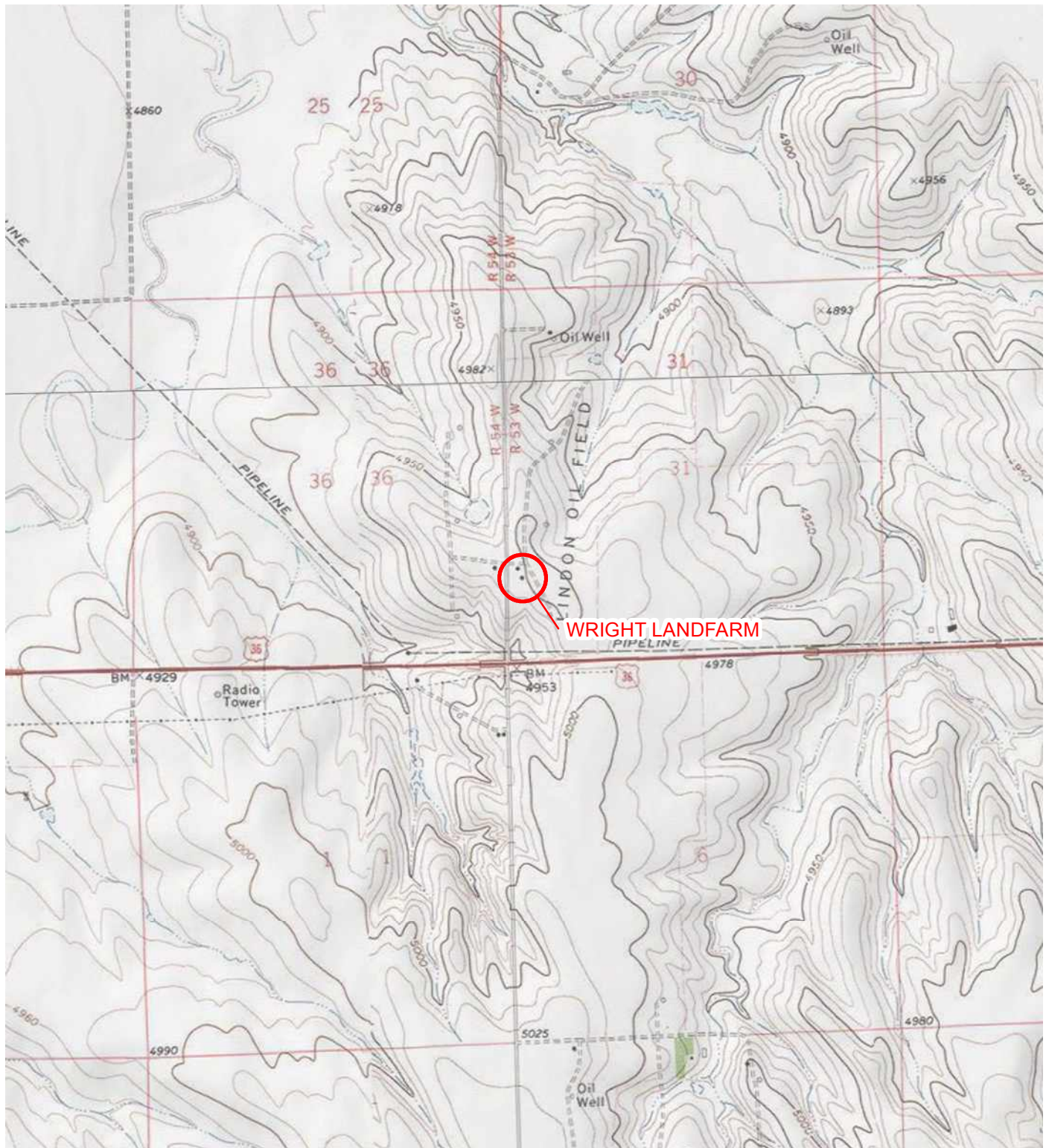


IMAGE COURTESY OF ESRI/BING MAPS

# LEGEND

○ SITE LOCATION

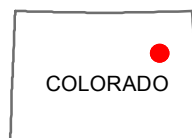
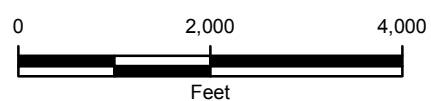


FIGURE 1  
SITE LOCATION MAP  
WRIGHT LANDFARM  
SWSW SEC 31-T3S-R53W  
WASHINGTON COUNTY, COLORADO  
BEREN CORPORATION



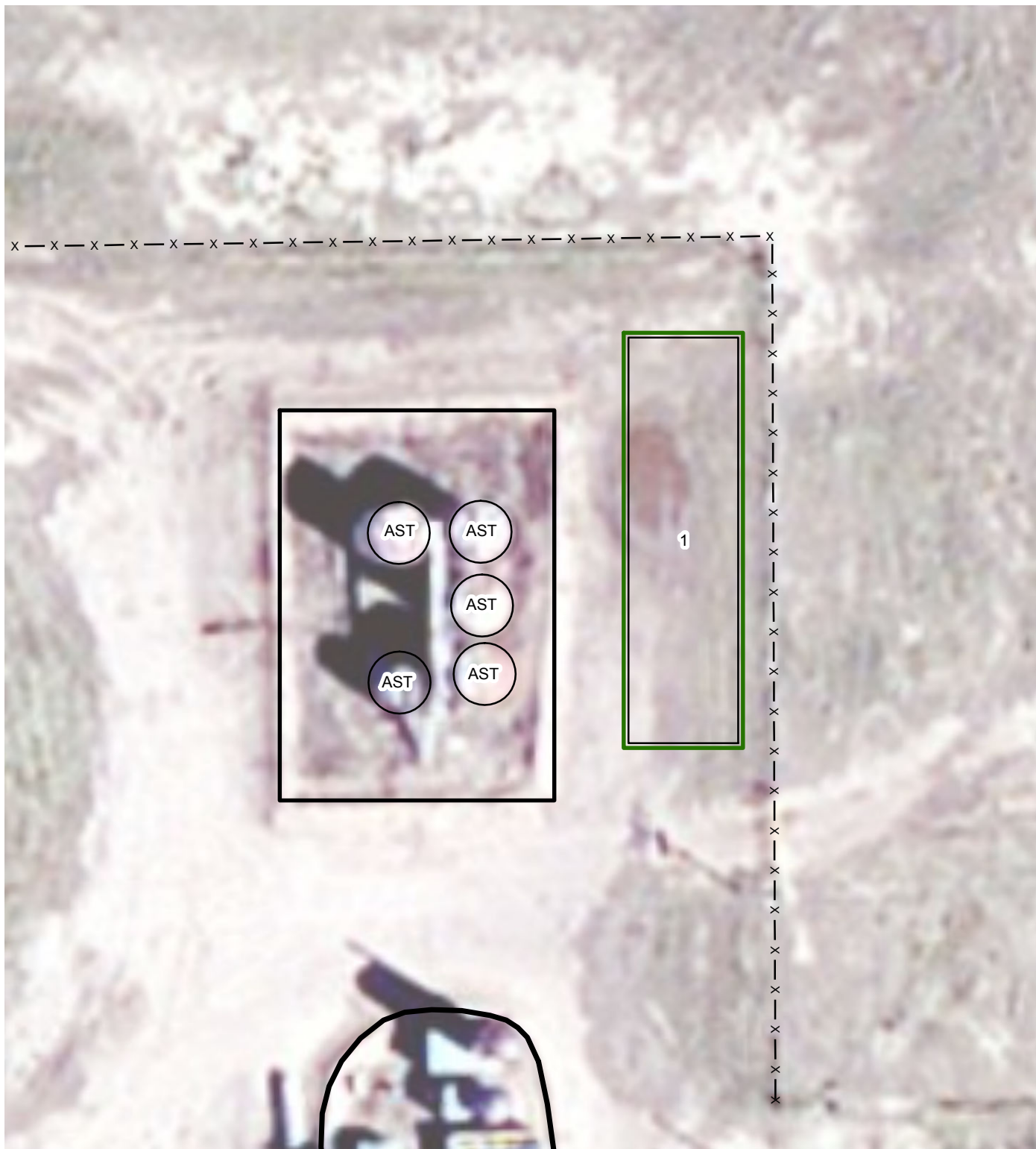


IMAGE COURTESY OF ESRI

## LEGEND

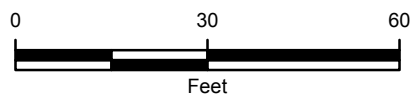
x — x FENCE

1 LANDFARM CELL

LANDFARM EXTENT

BERM

AST: ABOVEGROUND STORAGE TANK



**FIGURE 2**  
**SITE MAP**  
 WRIGHT LANDFARM  
 SWSW SEC 31-T3S-R53W  
 WASHINGTON COUNTY, COLORADO  
**BEREN CORPORATION**



**TABLE**



**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
**WRIGHT OIL SKIM PIT LANDFARM**  
**WASHINGTON COUNTY, COLORADO**  
**BEREN CORPORATION**

| Sample ID                             | Sample Date | TPH-DRO<br>(mg/kg) |
|---------------------------------------|-------------|--------------------|
| Comp01                                | 3/31/2015   | <b>7,900</b>       |
| COGCC Table 910-1 Concentration Level |             | 500                |

**NOTES:**

COGCC - Colorado Oil and Gas Conservation Commission

TPH-DRO - Total Petroleum Hydrocarbons-Diesel Range Organics

mg/kg - milligrams per kilograms

< - less than the stated laboratory method reporting limit

**Bold** indicates value exceeds COGCC concentration level



**ATTACHMENT A**  
**LABORATORY ANALYTICAL REPORT**



# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 08, 2015

Eric Lang  
LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada, CO 80003  
RE: BNC - Cook - Wright

Enclosed are the results of analyses for samples received by Summit Scientific on 04/02/15 16:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury  
President



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

Project: BNC - Cook - Wright  
Project Number: 041512004  
Project Manager: Eric Lang

Reported:  
04/08/15 15:28

### ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled   | Date Received  |
|-----------|---------------|--------|----------------|----------------|
| CS01      | 1504021-01    | Soil   | 03/31/15 14:00 | 04/02/15 16:15 |

Summit Scientific 1504021  
S<sub>2</sub>

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

Page 1 of 1

Client: LT Environmental Project Manager: Eric Lange  
Address: 4600 W. 60th Avenue E-Mail: elange@ltenv.com  
City/State/Zip: Arvada, CO 80003  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Project Name: Cook - Wright  
Sampler Name: B. Finn Project Number: 041512004

| ID | Sample Description | Date Sampled | Time Sampled | # of containers | Preservative |                  |      |                 | Matrix      |      |                | Analysis Requested |     |  |  | Special Instructions |  |
|----|--------------------|--------------|--------------|-----------------|--------------|------------------|------|-----------------|-------------|------|----------------|--------------------|-----|--|--|----------------------|--|
|    |                    |              |              |                 | HCl          | HNO <sub>3</sub> | None | Other (Specify) | Groundwater | Soil | Air-Canister # | Other (Specify)    | DRO |  |  |                      |  |
| 1  | CS01               | 03/31/2015   | 1400         | 1               |              |                  | X    |                 |             | X    |                |                    | X   |  |  |                      |  |
| 2  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 3  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 4  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 5  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 6  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 7  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 8  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 9  |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |
| 10 |                    |              |              |                 |              |                  |      |                 |             |      |                |                    |     |  |  |                      |  |

|                                     |                                   |                                 |                               |  |        |
|-------------------------------------|-----------------------------------|---------------------------------|-------------------------------|--|--------|
| Relinquished by: <u>[Signature]</u> | Date/Time: <u>04/02/2015 1615</u> | Received by: <u>[Signature]</u> | Date/Time: <u>4/2/15 1615</u> | Turn Around Time (Check)<br>Same Day <input type="checkbox"/> 72 hours <input type="checkbox"/><br>24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/><br>48 hours <input type="checkbox"/> | Notes: |
| Relinquished by:                    | Date/Time:                        | Received by:                    | Date/Time:                    | Sample Integrity:<br>Temperature Upon Receipt: <u>5.3°C</u><br>Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No   |        |
| Relinquished by:                    | Date/Time:                        | Received by:                    | Date/Time:                    |  |        |

www.s2scientific.com

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: BNC - Cook - Wright

Project Number: 041512004  
Project Manager: Eric Lang

**Reported:**  
04/08/15 15:28

**CS01**  
**1504021-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/31/15 14:00**

| Analyte              | Result      | Reporting<br>Limit | Units | Dilution | Batch   | Prepared | Analyzed | Method | Notes |
|----------------------|-------------|--------------------|-------|----------|---------|----------|----------|--------|-------|
| <b>C10-C28 (DRO)</b> | <b>7900</b> | 50                 | mg/kg | 1        | 1504047 | 04/06/15 | 04/07/15 | 8015M  |       |

Date Sampled: **03/31/15 14:00**

| Analyte                       | Result | Reporting<br>Limit | Units         | Dilution | Batch | Prepared | Analyzed | Method | Notes       |
|-------------------------------|--------|--------------------|---------------|----------|-------|----------|----------|--------|-------------|
| <i>Surrogate: o-Terphenyl</i> |        | <i>1950 %</i>      | <i>30-150</i> |          | "     | "        | "        | "      | <i>S-02</i> |

Summit Scientific

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

Project: BNC - Cook - Wright

Project Number: 041512004  
Project Manager: Eric Lang

**Reported:**  
04/08/15 15:28

**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 1504047 - EPA 3550A**

**Blank (1504047-BLK1)**

Prepared & Analyzed: 04/06/15

C10-C28 (DRO) ND 50 mg/kg

Surrogate: o-Terphenyl 13.2 " 12.2 109 30-150

**LCS (1504047-BS1)**

Prepared & Analyzed: 04/06/15

C10-C28 (DRO) 439 50 mg/kg 501 87.6 73-134

Surrogate: o-Terphenyl 13.1 " 12.2 107 30-150

**Matrix Spike (1504047-MS1)**

Source: 1504031-01

Prepared & Analyzed: 04/06/15

C10-C28 (DRO) 668 50 mg/kg 477 120 115 50-148

Surrogate: o-Terphenyl 14.1 " 11.6 121 30-150

**Matrix Spike Dup (1504047-MSD1)**

Source: 1504031-01

Prepared & Analyzed: 04/06/15

C10-C28 (DRO) 667 50 mg/kg 469 120 117 50-148 0.196 13

Surrogate: o-Terphenyl 14.0 " 11.4 122 30-150

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

Project: BNC - Cook - Wright  
Project Number: 041512004  
Project Manager: Eric Lang

**Reported:**  
04/08/15 15:28

### Notes and Definitions

S-02      The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

DET      Analyte DETECTED

ND      Analyte NOT DETECTED at or above the reporting limit

NR      Not Reported

dry      Sample results reported on a dry weight basis

RPD      Relative Percent Difference

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Summit Scientific

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