

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-141  
Revised August 8, 2011

Submit 1 Copy to appropriate District Office to  
accordance with 19.15.29 NMAC.

**Release Notification and Corrective Action**

**OPERATOR**

Initial Report  Final Report

Name of Company <b>ConocoPhillips Company</b>	Contact <b>Lisa Hunter</b>
Address <b>3401 East 30<sup>th</sup> St, Farmington, NM</b>	Telephone No. <b>(505) 258-1607</b>
Facility Name: <b>Ludwick LS #8</b>	Facility Type: <b>Gas Well</b>
Surface Owner <b>BLM</b>	Mineral Owner <b>BLM - SF-078194</b>
API No. <b>30045090280</b>	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
<b>H</b>	<b>31</b>	<b>30N</b>	<b>10W</b>	<b>1650</b>	<b>North</b>	<b>968</b>	<b>East</b>	<b>San Juan</b>

Latitude 36.77098 Longitude -107.91928

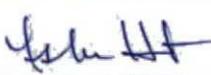
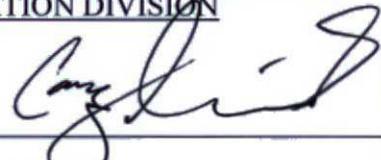
**NATURE OF RELEASE**

Type of Release <b>Hydrocarbon</b>	Volume of Release <b>Unknown</b>	Volume Recovered <b>12cyds</b>
Source of Release <b>Below Grade Tank (BGT)</b>	Date and Hour of Occurrence <b>Unknown</b>	Date and Hour of Discovery <b>06/21/2016 10:00 a.m.</b>
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom? <b>N/A</b>	
By Whom? <b>N/A</b>	Date and Hour <b>N/A</b>	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. <b>N/A</b>	<b>OIL CONS. DIV DIST. 3</b> <b>SEP 14 2016</b>
If a Watercourse was Impacted, Describe Fully.* <b>N/A</b>		

Describe Cause of Problem and Remedial Action Taken.\*  
**Below-Grade Tank Closure activities with samples taken resulting in constituents exceeded standards outlined by 19.15.17.13 NMAC.**

Describe Area Affected and Cleanup Action Taken.\*  
**The initial below grade tank field sample results were above regulatory standard by USEPA method 418.1 for TPH and Organic Vapors, confirming a release. Approximately 12 yds of soil was removed and resampled. The sample was then transported to the lab and analytical results were below the regulatory standards set forth in the NMOCD Guidelines for Remediation of Leaks, Spills and Release; therefore no further action is required.**

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: <b>Lisa Hunter</b>	Approved by Environmental Specialist: 	
Title: <b>Field Environmental Specialist</b>	Approval Date: <b>10/19/16</b>	Expiration Date:
E-mail Address: <b>Lisa.Hunter@cop.com</b>	Conditions of Approval: <b>—</b>	Attached <input type="checkbox"/>
Date: <b>September 8, 2016</b>	Phone: <b>(505) 258-1607</b>	

\* Attach Additional Sheets If Necessary

#NCL 1629337377

17

# **Rule** Engineering, LLC

Solutions to Regulations for Industry

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September 1, 2016

Ms. Lisa Hunter  
ConocoPhillips  
San Juan Business Unit  
5525 Highway 64  
Farmington, New Mexico 87401

**Re: Ludwick LS #8  
Below Grade Tank Closure Sampling Report**

Dear Ms. Hunter:

This report summarizes the below grade tank (BGT) closure sampling activities conducted by Rule Engineering, LLC (Rule) at the ConocoPhillips Ludwick LS #8 located in Unit Letter H, Section 31, Township 30N, Range 10W in San Juan County, New Mexico. Activities included collection and analysis of three 5-point composite soil confirmation samples from various depths beneath the BGT on June 21, 2016. A topographic map of the location is included as Figure 1 and an aerial site map is included as Figure 2.

## **BGT Summary**

**Site Name** – Ludwick LS #8

**Location** – Unit Letter H, Section 31, Township 30N, Range 10W

**API Number** – 30-045-09028

**Wellhead Latitude/Longitude** – N36.77103 and W107.91954

**BGT Latitude/Longitude** – N36.77098 and W107.91928

**Land Jurisdiction** – Bureau of Land Management

**Size of BGT** – 95 barrels (bbls) being upgraded to 120 bbls

**Date of BGT Closure Soil Sampling** – June 21, 2016

## **BGT Closure Standards**

As outlined in 19.15.17.13 New Mexico Administrative Code (NMAC), BGT closure standards for the Ludwick LS #8 are as follows: 0.2 milligrams per kilogram (mg/kg) benzene, 50 mg/kg total benzene, toluene, ethylbenzene, and total xylenes (BTEX), 100 mg/kg total petroleum hydrocarbons (TPH), and 250 mg/kg chlorides.

## **Field Activities**

On June 21, 2016, following removal of the BGT tank, Rule personnel conducted a visual inspection for surface/subsurface indications of a release. Staining and odor was observed in the soils immediately below the tank. Rule personnel then collected a five-point composite sample (SC-1) from 0.5 feet beneath the floor of the BGT excavation. Based on field results for sample SC-1, two feet of soils were removed from the BGT cellar and composite sample SP-1 was collected. Due to

vary sandy conditions at two feet below the BGT, an additional composite sample (SP-2) was collected from approximately five feet below the BGT to ensure petroleum hydrocarbons had not wicked through the sandy material to accumulate at the clayey material found at five feet below the BGT. Approximately 12 cubic yards of soil were transported to a local OCD approved landfarm for disposal/remediation. Figure 2 provides the location of the soil samples collected from below the BGT. The field work summary sheet is attached.

### **Soil Sampling**

Soil samples SC-1, SP-1, and SP-2 are five-point composites of S-1 through S-5, collected at 0.5, 2, and 5 feet below the BGT, respectively. A portion of each sample was field screened for volatile organic compounds (VOCs) and field analyzed for TPH. Soil sample SC-1 was also field analyzed for chlorides.

Field screening for VOC vapors was conducted with a photo-ionization detector (PID). Prior to field screening, the PID was calibrated with 100 parts per million (ppm) isobutylene gas. Field analysis for TPH was conducted per U.S. Environmental Protection Agency (USEPA) Method 418.1, utilizing a total hydrocarbon analyzer. Prior to field analysis, the machine was calibrated following the manufacturer's procedure which includes calculation of a calibration curve using known concentration standards. Field screening for chloride was conducted using the Hach chloride low range test kit. Chloride concentrations were determined by drop count titration method using silver nitrate titrant.

The portions of SP-1 and SP-2 collected for laboratory analysis were placed into laboratory supplied glassware, labeled, and maintained on ice until delivery to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico. The samples were analyzed for BTEX per USEPA Method 8021B, TPH per USEPA Method 418.1 and 8015D, and chlorides per USEPA Method 300.0.

### **Field and Analytical Results**

Field sampling results for soil confirmation sample SC-1 indicated a VOC concentration of 120 ppm and a TPH concentration of 110 mg/kg. Field chloride concentrations were reported at 40 mg/kg. Field sampling results for soil confirmation samples SP-1 and SP-2 indicated VOC concentrations of 15.2 ppm and 0.9 ppm respectively. Additionally, field sampling results for TPH concentrations for SP-1 and SP-2 were 60.2 mg/kg and 24.0 mg/kg, respectively.

Laboratory analytical results for samples SP-1 and SP-2 reported benzene, total BTEX, TPH (GRO/DRO/MRO), and chloride concentrations below the laboratory reporting limits. Laboratory results are summarized in Table 1, and the analytical laboratory report is attached.

Ms. Lisa Hunter  
Ludwick LS #8  
September 1, 2016  
Page 3 of 3

### **Conclusions**

On June 21, 2016, BGT closure sampling activities were conducted at the ConocoPhillips Ludwick LS #8 during an equipment upgrade at the site. Field screening results for confirmation sample SC-1 indicated VOC and TPH concentrations above the BGT Closure Standards. Approximately 12 cubic yards of soil was removed from the base of the BGT cellar and transported to a local OCD approved landfarm for disposal/remediation. Confirmation samples SP-1 and SP-2 were collected from two feet and five feet below the original depth of the BGT cellar. Field screening and laboratory analytical results for confirmation soil samples SP-1 and SP-2 indicate concentrations below the BGT Closure Standards for benzene, total BTEX, TPH, and chlorides as outlined in 19.15.17.13 NMAC. Based on field sampling and laboratory analytical results, no further work is recommended.

Rule Engineering appreciates the opportunity to provide services to ConocoPhillips. If you have any questions, please contact me at (505) 325-1055.

Sincerely,  
**Rule Engineering, LLC**

  
Heather M. Woods, P.G.  
Area Manager/Geologist

### **Attachments:**

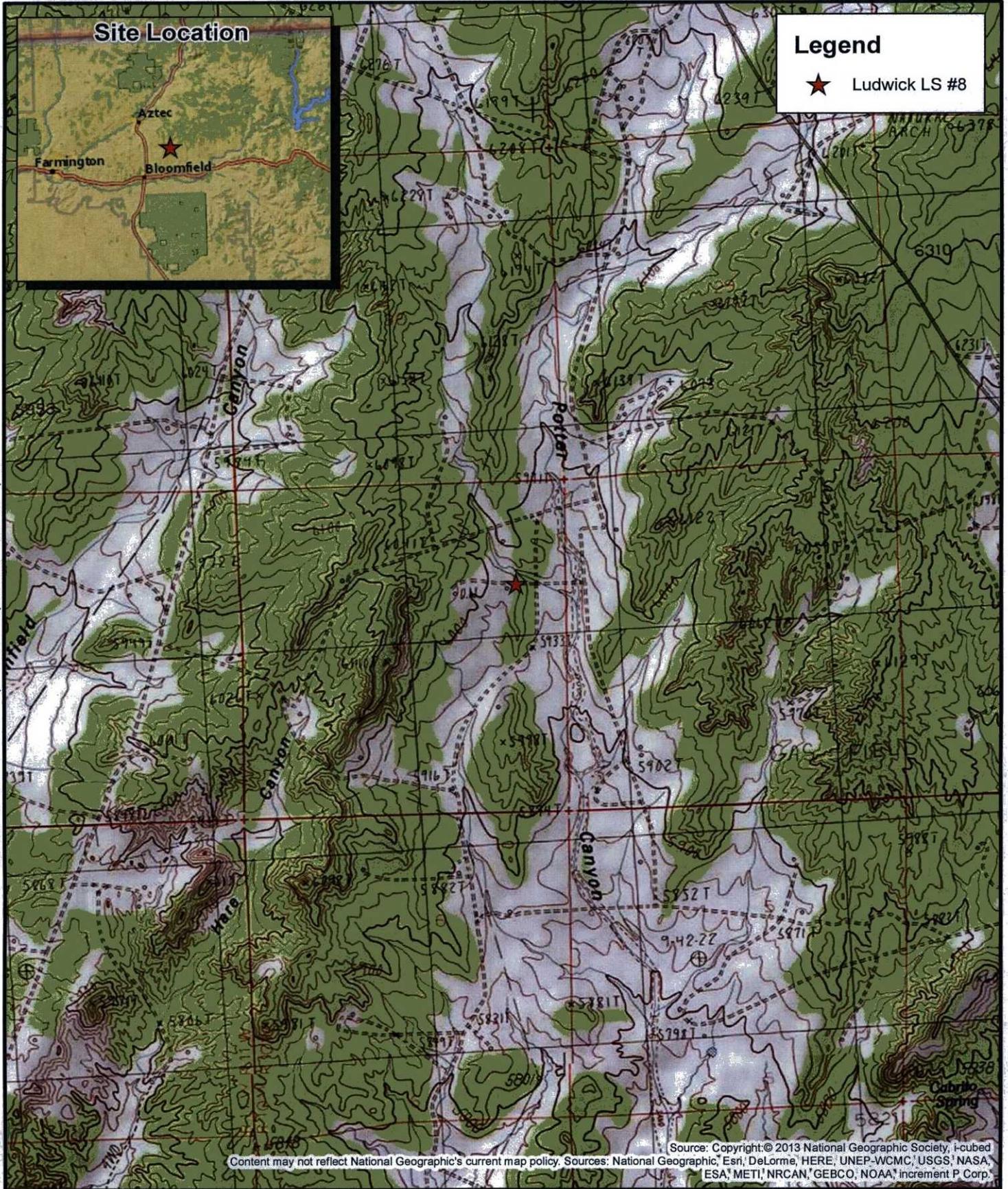
Table 1. BGT Soil Sampling Results  
Figure 1. Topographic Map  
Figure 2. Aerial Site Map  
Field Work Summary Sheet  
Analytical Laboratory Report

**Table 2. Laboratory Analytical Results**  
**ConocoPhillips**  
**Ludwick LS #8**  
**San Juan County, New Mexico**

Sample Name	Date	Approximate Sample Depth (ft bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)	Chloride (mg/kg)
BGT Closure Standards*			0.2	NE	NE	NE	50		100		250
Removed by Excavation											
SC-1	6/21/2016	4.5	--	--	--	--	--	--	--	--	--
Confirmation Samples											
SP-1	6/21/2016	6	<0.024	<0.047	<0.047	<0.094	<0.212	<4.7	<9.9	<50	<30
SP-2	6/21/2016	9	<0.023	<0.046	<0.046	<0.093	<0.208	<4.6	<9.8	<49	<30

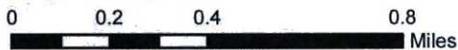
Notes: NMOCD - New Mexico Oil Conservation Division  
ft bgs - feet below grade surface  
mg/kg - milligrams per kilogram  
BTEX - benzene, toluene, ethylbenzene, and xylenes  
TPH - total petroleum hydrocarbons  
GRO - gasoline range organics  
DRO - diesel range organics  
\*Per 19.15.17.13 NMAC

Document Path: U:\ConocoPhillips\ConocoPhillips\Ludwick\Ludwick Topo.mxd



Source: Copyright © 2013 National Geographic Society, I-cubed  
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

**Rule Engineering, LLC**  
Solutions to Regulations for Industry



Aztec Quadrangle  
1:24,000

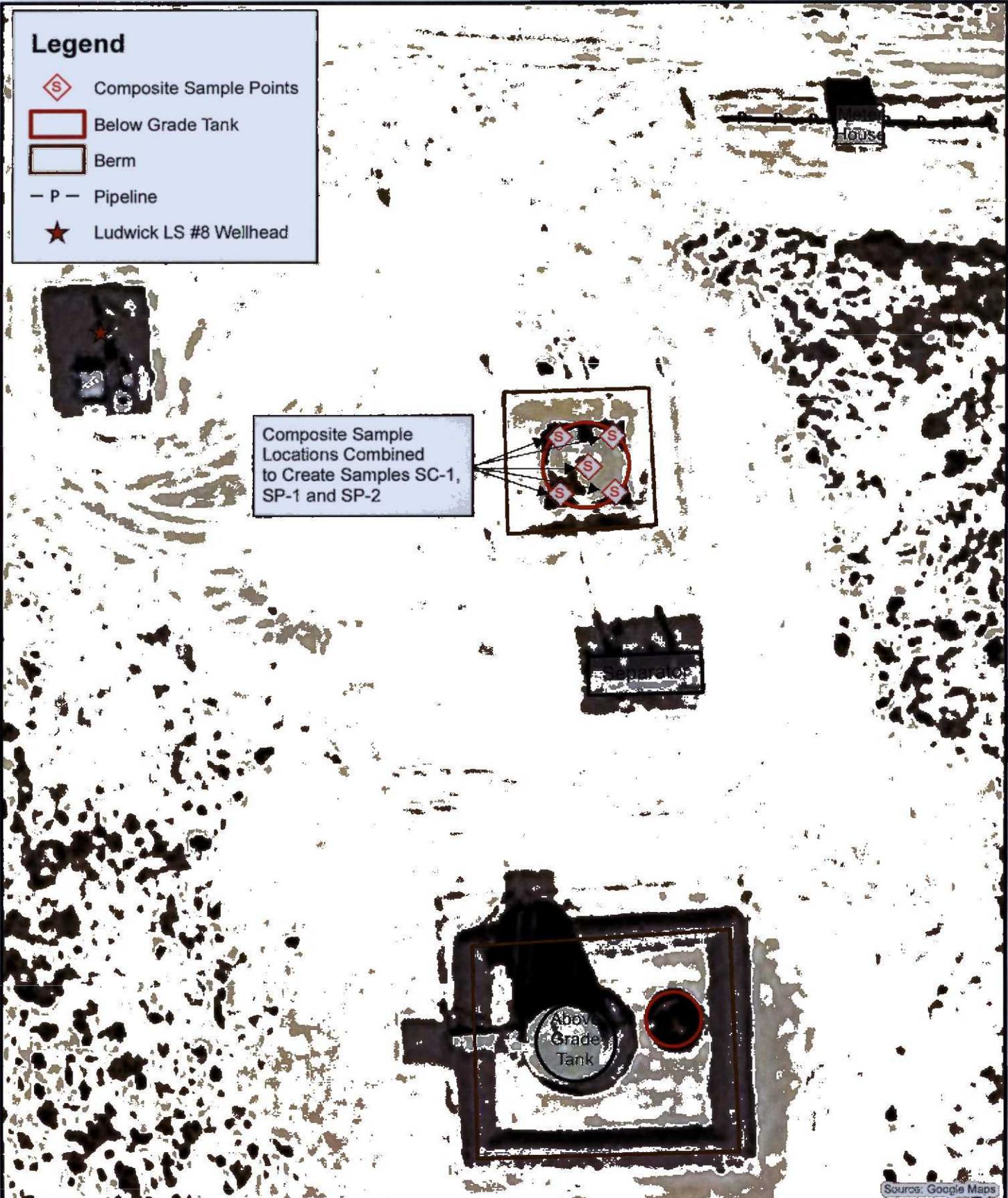


H-S31-T30N-R10W  
N36.77098, W107.91928  
San Juan County, NM  
API: 30-045-09028

**Figure 1**  
**Topographic Site Map**  
Ludwick LS #8

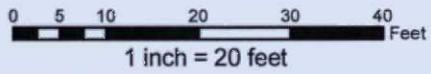
### Legend

-  Composite Sample Points
-  Below Grade Tank
-  Berm
-  Pipeline
-  Ludwick LS #8 Wellhead



Source: Google Maps

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Solutions to Regulations for Industry



**ConocoPhillips**

H-S31-T30N-R10W  
N36.77098, W107.91928  
San Juan County, NM  
API: 30-045-09028

**Figure 2**  
**Aerial Site Map**  
Ludwick LS #8

**Rule Engineering Field Work Summary Sheet**

Company: ConocoPhillips  
 Location: Ludwick LS #8  
 API: 30-045-09028  
 Legals: H-S31-T30N-R10W  
 County: San Juan  
 Land Jurisdiction: Bureau of Land Management

Date:	6/21/16
Staff:	Justin Valdez

Wellhead GPS: 36.77103, -107.91954  
 BGT GPS: 36.77098, -107.91928

**Siting Information based on BGT Location:**

Site Rank 30

Groundwater: Estimated to be less than 50 feet below grade surface based on topology and cathodic well reports.

Surface Water: An unnamed ephemeral wash is located approximately 250 feet northeast of the BGT.

Wellhead Protection: No water wells identified within 1,000 ft of location.

Objective: Closure sampling for BGT during upgrade of tank from 95 bbls to 120 bbls

Tank Size: 95 barrels, removed during closure activities

Liner: No liner present

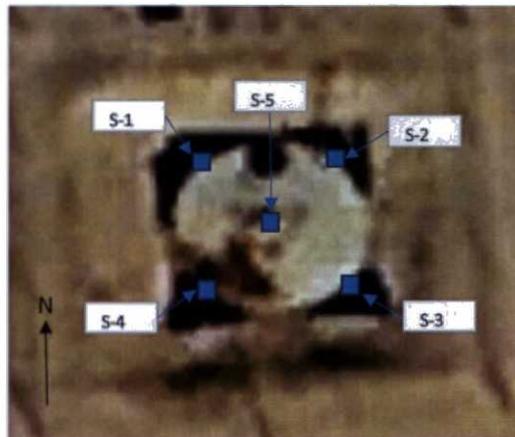
Observations: Staining and odor was observed below the tank

Notes: Two feet of material was removed from the BGT cellar and transported to the landfarm for disposal/remediation. Area backfilled with clean, imported soil.

**Field Sampling Information**

Name	Type of Sample	Collection Time	Collection Location	VOCs <sup>1</sup> (ppm)	VOCs time	TPH <sup>2</sup> mg/kg	TPH Time	Chloride <sup>3</sup> mg/kg	Chloride Time
SC-1	Composite	11:20	See below	120	11:40	110	11:45	40	11:50
SP-1	Composite	12:15	See below	15.2	12:22	60.2	12:47	--	--
SP-2	Composite	13:00	See below	0.9	13:03	24.0	13:27	--	--

SC-1, SP-2, and SP-3 are 5-point composites of S-1 through S-5, collected at 0.5, 2, and 3 ft below the BGT, respectively.



**Field Sampling Notes:**

<sup>1</sup> Field screening for volatile organic compounds (VOC) vapors was conducted with a photo-ionization detector (PID). Before beginning field screening, the PID was calibrated with 100 parts per million (ppm) isobutylene gas.

<sup>2</sup> Field analysis for TPH was conducted using a total hydrocarbon analyzer. Prior to field analysis, the machine was calibrated following the manufacturer's procedure which includes calculation of a calibration curve using known concentration standards.

<sup>3</sup> Field screening for chlorides was conducted using the Hach chloride low range test kit. Chloride concentrations are determined by drop count titration method using silver nitrate titrant.



Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [www.hallenvironmental.com](http://www.hallenvironmental.com)

August 24, 2016

Heather Woods  
Rule Engineering LLC  
501 Airport Dr., Ste 205  
Farmington, NM 87401  
TEL: (505) 325-1055  
FAX

RE: Ludwick LS 8

OrderNo.: 1606C03

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/22/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued June 29, 2016.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

Analytical Report

Lab Order 1606C03

Date Reported: 8/24/2016

**Hall Environmental Analysis Laboratory, Inc.**

CLIENT: Rule Engineering LLC

Client Sample ID: SP-1

Project: Ludwick LS 8

Collection Date: 6/21/2016 12:15:00 PM

Lab ID: 1606C03-001

Matrix: SOIL

Received Date: 6/22/2016 8:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	6/24/2016 6:15:37 PM	26073
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	6/23/2016 11:11:31 AM	26021
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/23/2016 11:11:31 AM	26021
Surr: DNOP	93.5	70-130		%Rec	1	6/23/2016 11:11:31 AM	26021
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/27/2016 3:41:48 AM	25994
Surr: BFB	98.7	80-120		%Rec	1	6/27/2016 3:41:48 AM	25994
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	6/27/2016 3:41:48 AM	25994
Toluene	ND	0.047		mg/Kg	1	6/27/2016 3:41:48 AM	25994
Ethylbenzene	ND	0.047		mg/Kg	1	6/27/2016 3:41:48 AM	25994
Xylenes, Total	ND	0.094		mg/Kg	1	6/27/2016 3:41:48 AM	25994
Surr: 4-Bromofluorobenzene	96.0	80-120		%Rec	1	6/27/2016 3:41:48 AM	25994

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

**Hall Environmental Analysis Laboratory, Inc.**

**CLIENT:** Rule Engineering LLC  
**Project:** Ludwick LS 8  
**Lab ID:** 1606C03-002

**Client Sample ID:** SP-2  
**Collection Date:** 6/21/2016 1:00:00 PM  
**Received Date:** 6/22/2016 8:10:00 AM

**Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>LGT</b>
Chloride	ND	30		mg/Kg	20	6/24/2016 6:28:02 PM	26073
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	6/23/2016 11:33:40 AM	26021
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/23/2016 11:33:40 AM	26021
Surr: DNOP	92.0	70-130		%Rec	1	6/23/2016 11:33:40 AM	26021
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/27/2016 4:05:23 AM	25994
Surr: BFB	97.0	80-120		%Rec	1	6/27/2016 4:05:23 AM	25994
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	6/27/2016 4:05:23 AM	25994
Toluene	ND	0.046		mg/Kg	1	6/27/2016 4:05:23 AM	25994
Ethylbenzene	ND	0.046		mg/Kg	1	6/27/2016 4:05:23 AM	25994
Xylenes, Total	ND	0.093		mg/Kg	1	6/27/2016 4:05:23 AM	25994
Surr: 4-Bromofluorobenzene	92.9	80-120		%Rec	1	6/27/2016 4:05:23 AM	25994

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1606C03

24-Aug-16

Client: Rule Engineering LLC

Project: Ludwick LS 8

Sample ID	MB-26073	SampType:	MBLK	TestCode:	EPA Method 300.0: Anions					
Client ID:	PBS	Batch ID:	26073	RunNo:	35186					
Prep Date:	6/24/2016	Analysis Date:	6/24/2016	SeqNo:	1088718	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	LCS-26073	SampType:	LCS	TestCode:	EPA Method 300.0: Anions					
Client ID:	LCSS	Batch ID:	26073	RunNo:	35186					
Prep Date:	6/24/2016	Analysis Date:	6/24/2016	SeqNo:	1088719	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.2	90	110			

## Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1606C03

24-Aug-16

Client: Rule Engineering LLC

Project: Ludwick LS 8

Sample ID	MB-26021	SampType:	MBLK	TestCode:	EPA Method 8015M/D: Diesel Range Organics					
Client ID:	PBS	Batch ID:	26021	RunNo:	35115					
Prep Date:	6/23/2016	Analysis Date:	6/23/2016	SeqNo:	1086399	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.7		10.00		96.6	70	130			

Sample ID	LCS-26021	SampType:	LCS	TestCode:	EPA Method 8015M/D: Diesel Range Organics					
Client ID:	LCSS	Batch ID:	26021	RunNo:	35115					
Prep Date:	6/23/2016	Analysis Date:	6/23/2016	SeqNo:	1086400	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	10	50.00	0	88.0	62.6	124			
Surr: DNOP	4.5		5.000		89.6	70	130			

Sample ID	1606C03-001AMS	SampType:	MS	TestCode:	EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SP-1	Batch ID:	26021	RunNo:	35116					
Prep Date:	6/23/2016	Analysis Date:	6/23/2016	SeqNo:	1086501	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	10	50.45	0	74.3	33.9	141			
Surr: DNOP	4.6		5.045		91.3	70	130			

Sample ID	1606C03-001AMSD	SampType:	MSD	TestCode:	EPA Method 8015M/D: Diesel Range Organics					
Client ID:	SP-1	Batch ID:	26021	RunNo:	35116					
Prep Date:	6/23/2016	Analysis Date:	6/23/2016	SeqNo:	1086514	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	35	9.6	48.12	0	72.1	33.9	141	7.83	20	
Surr: DNOP	4.4		4.812		91.0	70	130	0	0	

## Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1606C03

24-Aug-16

Client: Rule Engineering LLC

Project: Ludwick LS 8

Sample ID	MB-25994	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	25994	RunNo:	35223					
Prep Date:	6/22/2016	Analysis Date:	6/27/2016	SeqNo:	1089084	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	990		1000		99.1	80	120			

Sample ID	LCS-25994	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	25994	RunNo:	35223					
Prep Date:	6/22/2016	Analysis Date:	6/27/2016	SeqNo:	1089085	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	111	80	120			
Surr: BFB	1100		1000		109	80	120			

## Qualifiers:

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank           |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                            |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits                |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                                    |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                                |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1606C03

24-Aug-16

Client: Rule Engineering LLC

Project: Ludwick LS 8

Sample ID	<b>MB-25994</b>	SampType:	<b>MBLK</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>PBS</b>	Batch ID:	<b>25994</b>	RunNo:	<b>35223</b>					
Prep Date:	<b>6/22/2016</b>	Analysis Date:	<b>6/27/2016</b>	SeqNo:	<b>1089121</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.97		1.000		96.8	80	120			

Sample ID	<b>LCS-25994</b>	SampType:	<b>LCS</b>	TestCode:	<b>EPA Method 8021B: Volatiles</b>					
Client ID:	<b>LCSS</b>	Batch ID:	<b>25994</b>	RunNo:	<b>35223</b>					
Prep Date:	<b>6/22/2016</b>	Analysis Date:	<b>6/27/2016</b>	SeqNo:	<b>1089124</b>	Units:	<b>mg/Kg</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	106	75.3	123			
Toluene	1.1	0.050	1.000	0	108	80	124			
Ethylbenzene	1.1	0.050	1.000	0	109	82.8	121			
Xylenes, Total	3.2	0.10	3.000	0	107	83.9	122			
Surr: 4-Bromofluorobenzene	1.0		1.000		105	80	120			

### Qualifiers:

- |   |   |
|---|---|
| * Value exceeds Maximum Contaminant Level.              | B Analyte detected in the associated Method Blank           |
| D Sample Diluted Due to Matrix                          | E Value above quantitation range                            |
| H Holding times for preparation or analysis exceeded    | J Analyte detected below quantitation limits                |
| ND Not Detected at the Reporting Limit                  | P Sample pH Not In Range                                    |
| R RPD outside accepted recovery limits                  | RL Reporting Detection Limit                                |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



HALL Environmental Analysis Laboratory  
 4901 Hawkins NE  
 Albuquerque, NM 87109  
 TEL: 505-345-3975 FAX: 505-345-4107  
 Website: www.hallenvironmental.com

# Sample Log-In Check List

Client Name: **RULE-ENGINEERING LL** Work Order Number: **1606C03** RcptNo: **1**

Received by/date: *JA* *06/22/16*

Logged By: *Ashley Gallegos* **6/22/2016 8:10:00 AM** *AG*

Completed By: *Ashley Gallegos* **6/22/2016 8:50:56 AM** *AG*

Reviewed By: *J* *06/22/16*

**Chain of Custody**

- 1. Custody seals intact on sample bottles? Yes  No  Not Present
- 2. Is Chain of Custody complete? Yes  No  Not Present
- 3. How was the sample delivered? Courier

**Log In**

- 4. Was an attempt made to cool the samples? Yes  No  NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes  No  NA
- 6. Sample(s) in proper container(s)? Yes  No
- 7. Sufficient sample volume for indicated test(s)? Yes  No
- 8. Are samples (except VOA and ONG) properly preserved? Yes  No
- 9. Was preservative added to bottles? Yes  No  NA
- 10. VOA vials have zero headspace? Yes  No  No VOA Vials
- 11. Were any sample containers received broken? Yes  No
- 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes  No
- 13. Are matrices correctly identified on Chain of Custody? Yes  No
- 14. Is it clear what analyses were requested? Yes  No
- 15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes  No

# of preserved bottles checked for pH: \_\_\_\_\_  
 ( <2 or >12 unless noted )  
 Adjusted? \_\_\_\_\_  
 Checked by: \_\_\_\_\_

**Special Handling (if applicable)**

- 16. Was client notified of all discrepancies with this order? Yes  No  NA

Person Notified: \_\_\_\_\_ Date: \_\_\_\_\_  
 By Whom: \_\_\_\_\_ Via:  eMail  Phone  Fax  In Person  
 Regarding: \_\_\_\_\_  
 Client Instructions: \_\_\_\_\_

17. Additional remarks:

**18. Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.3	Good	Yes			

