

JAN 30 2014

1RP-12-13-3000  
XTO Energy, Inc., Grimes Pit #2  
January 30, 2014

RECEIVED

## INTRODUCTION

This summary is submitted to the New Mexico Oil Conservation Division (OCD) District 1 in Hobbs, New Mexico, on behalf of XTO Energy, Inc. (XTO), a subsidiary of ExxonMobil, for the investigation and closure of an unlined pit (Grimes Pit #2) that was used in conjunction with shallow wells and separation equipment by another operator, Windmill Oil Company, to recover crude oil from shallow groundwater. The pit is located in Unit G (SW/4, NE/4), Section 30, Township 18 South, Range 38 East, in Lea County, New Mexico. The geodetic position is north 32° 43' 08.03" and west 103° 11' 6.89". Figure 1 presents a topographic map. Figure 2 presents an aerial photograph.

## BACKGROUND

The U.S. Bureau of Land Management (BLM), as mineral owner, was unable to locate the former operator, believed to be Windmill Oil Company, to restore the area, including plugging wells, removing equipment (i.e., tanks, vessels and piping) and closing the pit. The site reverted back to ExxonMobil as a former oil and gas mineral lessee.

On October 15, 2013, XTO submitted a closure plan meeting the requirements of 19.15.17.13(C) NMAC to the OCD in Santa Fe, New Mexico. The closure plan was approved on October 22, 2013. On December 1, 2013, after providing notification to the landowner, Watson Construction, Inc., under supervision from Larson & Associates, Inc. (LAI) removed BS&W and hydrocarbon contaminated material from the pit. The materials were disposed at Sundance Services located east of Eunice, New Mexico.

On December 2, 2013, LAI personnel collected a 5 part composite sample from the bottom of the pit. The sample was submitted under preservation and chain of custody to Permian Basin Environmental Lab (PBELAB) located in Midland, Texas. The sample was analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) by method SW-846-8021B, total petroleum hydrocarbons (TPH), including, diesel (DRO), gasoline (GRO) and oil (ORO) range organics, by method SW-846-8015M and chloride by method E300. Table 1 presents the analytical data summary.

On December 18, 2013, the laboratory data summary was transmitted to the OCD in Santa Fe, New Mexico which requested that XTO to notify the OCD District 1 due to TPH exceeding the standard under 19.15.17.13(C).

On December 23, 2013, LAI personnel met with Mr. Geoffrey Leking, OCD District 1, to discuss the sample results and path forward. Mr. Leking requested XTO to submit an initial C-141 (Release Notification and Corrective Action) and delineate the extent of the TPH. On December 31, 2013, XTO submitted the initial C-141. The OCD District 1 assigned the site remediation action project number 1RP-12-13-2999.

*approved*  
*Geoffrey Leking*

Environmental Specialist

NMOC-DIST 1

2160114

FEB 10 2014

## **INVESTIGATION**

On January 7 and 8, 2013, Scarborough Drilling, Inc. (Scarborough) used an air rotary rig and jam tube sampler to collect soil samples at 5 locations (2-1 through 2-5) in the bottom and each direction (north, south, east and west) from the center of the pit. A sample was collected about every 5 feet to 30 feet and about every 10 feet to about 50 feet below ground surface (bgs). Groundwater was determined to occur at about 60 feet bgs. The samples were collected in 4 ounce glass jars that were preserved and delivered under chain of custody to Cardinal Laboratory located in Hobbs, New Mexico. The samples were analyzed for TPH, including DRO, GRO and ORO, by method SW-846-8015M. Duplicate samples were collected in 8 ounce glass jars for headspace analysis. The headspace samples were sealed with aluminum foil and warmed on the dashboard of the vehicle before measuring the organic vapor content with a calibrated photoionization detector (PID). The sample from each boring with the highest PID reading over 100 parts per million (ppm) was analyzed for BTEX by method SW-846-8021B. Table 2 presents the laboratory analytical data summary. Appendix B presents the laboratory reports.

Referring to Table 2, benzene and BTEX were below the OCD recommended remediation action level (RRAL) of 10 and 50 milligrams per kilogram (mg/Kg), respectively, in samples from borings 2-1 through 2-5. The TPH was delineated to the vertical and lateral limits of the borings.

## **REMEDIATION PLAN**

XTO proposes to excavate soil to approximately 7 feet bgs. A liner of at least 20 mils will be placed in the bottom of the excavation. The liner will be covered with clean soil and the excavation closed according to the reclamation plan approved by OCD in Santa Fe, on October 22, 2013.

## **TABLES**

**Table 1**  
**Initial Soil Sample Analytical Data Summary**  
**XTO Energy, Inc., Grimes Pit #2**  
**Lea County, New Mexico**

**1RP-12-13-3000**

Composite Sample	Sampling Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	TPH (C6 - C12)	TPH (>C12 - C28)	TPH (>C28 - C35)	TPH (C6 - C35)	Chloride
19.15.17.13(3) Standard		10	0.75	0.75	0.62	50					600
Pit #2	12/10/2013	<0.00105	<0.00211	<0.00105	0.00316	0.00316	32.1	1,630	462	2,130	58.9

**Table 2**  
**Delineation Sample Analytical Data Summary**  
**XTO Energy, Inc., Grimes Pit #2**  
**Lea County, New Mexico**

**1RP-12-13-3000**

Boring Number	Sample Depth	Sampling Date	Location	PID	Benzene	BTEX	TPH (C6 - C10)	TPH (>C10 - C28)	TPH (>C28 - C35)	TPH (C6 - C35)
<b>MOCD RRAL:</b>					<b>10</b>	<b>50</b>				<b>1,000</b>
2-1	10	01/07/2013	Center	347	0.253	6.931	32.1	1,150	245	1,427.1
	15	01/07/2014		345	--	--	79.5	1,040	228	1,347.5
	20	01/07/2014		344	--	--	94.7	1,360	261	1,715.7
	25	01/07/2014		345	--	--	740	4,030	689	5,459
	30	01/07/2014		84	--	--	248	1,740	322	2,020
	40	01/07/2014		62	--	--	111	1,890	386	2,387
	50	01/07/2014		15	--	--	78.8	690	116	884.8
2-2	5	01/08/2014	West	2.6	--	--	<10.0	56.7	<10.0	56.7
	10	01/08/2014		2.6	--	--	<10.0	<10.0	<10.0	<10.0
	15	01/08/2014		0.8	--	--	<10.0	<10.0	<10.0	<10.0
	20	01/08/2014		0.8	--	--	<10.0	<10.0	<10.0	<10.0
	25	01/08/2014		203.4	<0.200	2.312	160	1,720	239	2,119
	30	01/08/2014		103.8	--	--	130	2,080	334	2,544
	40	01/08/2014		134.6	--	--	<50.0	787	92.5	879.5
50	01/08/2014	119.3	--	--	64.8	1,590	272	1,926.8		
2-3	5	01/08/2014	North	4.4	--	--	<10.0	<10.0	<10.0	<10.0
	10	01/08/2014		2.6	--	--	<10.0	<10.0	<10.0	<10.0
	15	01/08/2014		2.6	--	--	<10.0	<10.0	<10.0	<10.0
	20	01/08/2014		0.8	--	--	<10.0	<10.0	<10.0	<10.0
	25	01/08/2014		184	<0.200	26.583	201	1,180	179	1,560
	30	01/08/2014		144	--	--	168	1,700	294	2,162
	40	01/08/2014		99	--	--	89.1	1,350	249	1,688.1
50	01/08/2014	94.2	--	--	172	2,101	368	2,641		
2-4	5	01/08/2014	East	3.4	--	--	<10.0	<10.0	<10.0	<10.0
	10	01/08/2014		0.9	--	--	<10.0	51.0	21.4	72.4

**Table 2**  
**Delineation Sample Analytical Data Summary**  
**XTO Energy, Inc., Grimes Pit #2**  
**Lea County, New Mexico**

1RP-12-13-3000

Boring Number	Sample Depth	Sampling Date	Location	PID	Benzene	Total BTEX	TPH (C6 - C10)	TPH (>C10 - C28)	TPH (>C28 - C35)	TPH (C6 - C35)
<b>MOCD RRAL:</b>					<b>10</b>	<b>50</b>				<b>1,000</b>
2-4	15	01/08/2014		1	--	--	<10.0	<10.0	<10.0	<10.0
	20	01/08/2014		24	--	--	<10.0	<10.0	<10.0	<10.0
	25	01/08/2014		296	--	--	<50	700	115	815
	30	01/08/2014		252.9	--	--	68.5	1,210	204	1,482.5
	40	01/08/2014		289	--	--	62.8	1,270	247	1,579.8
	50	01/08/2014		347	<1.00	2.867	134	2,690	461	3,285
2-5	5	01/08/2014	South	2.6	--	--	<10.0	39.6	17.1	56.7
	10	01/08/2014		6.3	--	--	<10.0	<10.0	<10.0	<10.0
	15	01/08/2014		4.8	--	--	<10.0	<10.0	<10.0	<10.0
	20	01/08/2014		11.5	--	--	<10.0	<10.0	<10.0	<10.0
	25	01/08/2014		211.5	<0.500	20.45	370	1,590	242	2,202
	30	01/08/2014		138.5	--	--	108	1,520	264	1,892
	40	01/08/2014		112.6	--	--	65.3	992	188	1,245
	50	01/08/2014		107.4	--	--	105	1,990	374	2,469

Notes: Samples analyzed by Cardinal Laboratories, Inc., Hobbs, New Mexico

Samples analyzed via EPA method SW-8021B (BTEX) and SW-8015M (TPH)

Depth is in feet below ground surface (bgs).

Photionization detector (PID) values are in parts per million (ppm)

Laboratory values are in milligrams per kilogram (mg/Kg) equivalent to parts per million (ppm).

-- No data available

## FIGURES

BSK

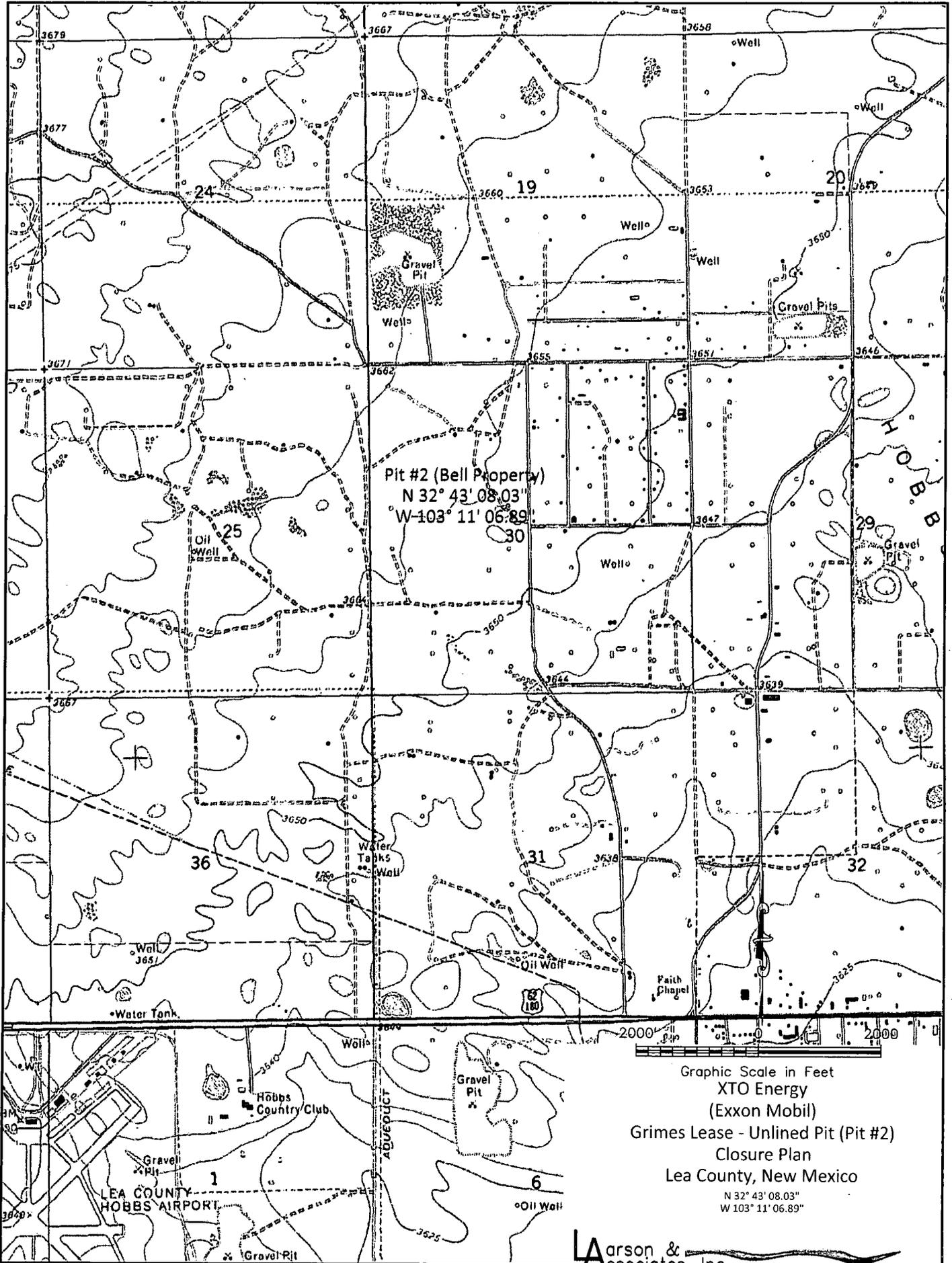


Figure 1 - Topographic Map

BSK



Graphic Scale in Feet  
XTO Energy  
(Exxon Mobil)  
Grimes Lease - Unlined Pit (Pit #3)  
Closure Plan  
Lea County, New Mexico  
N 32° 43' 04.94"  
W 103° 11' 08.95"

**L**arson &  
Associates, Inc.  
Environmental Consultants

Figure 2 - Aerial Map

BSK

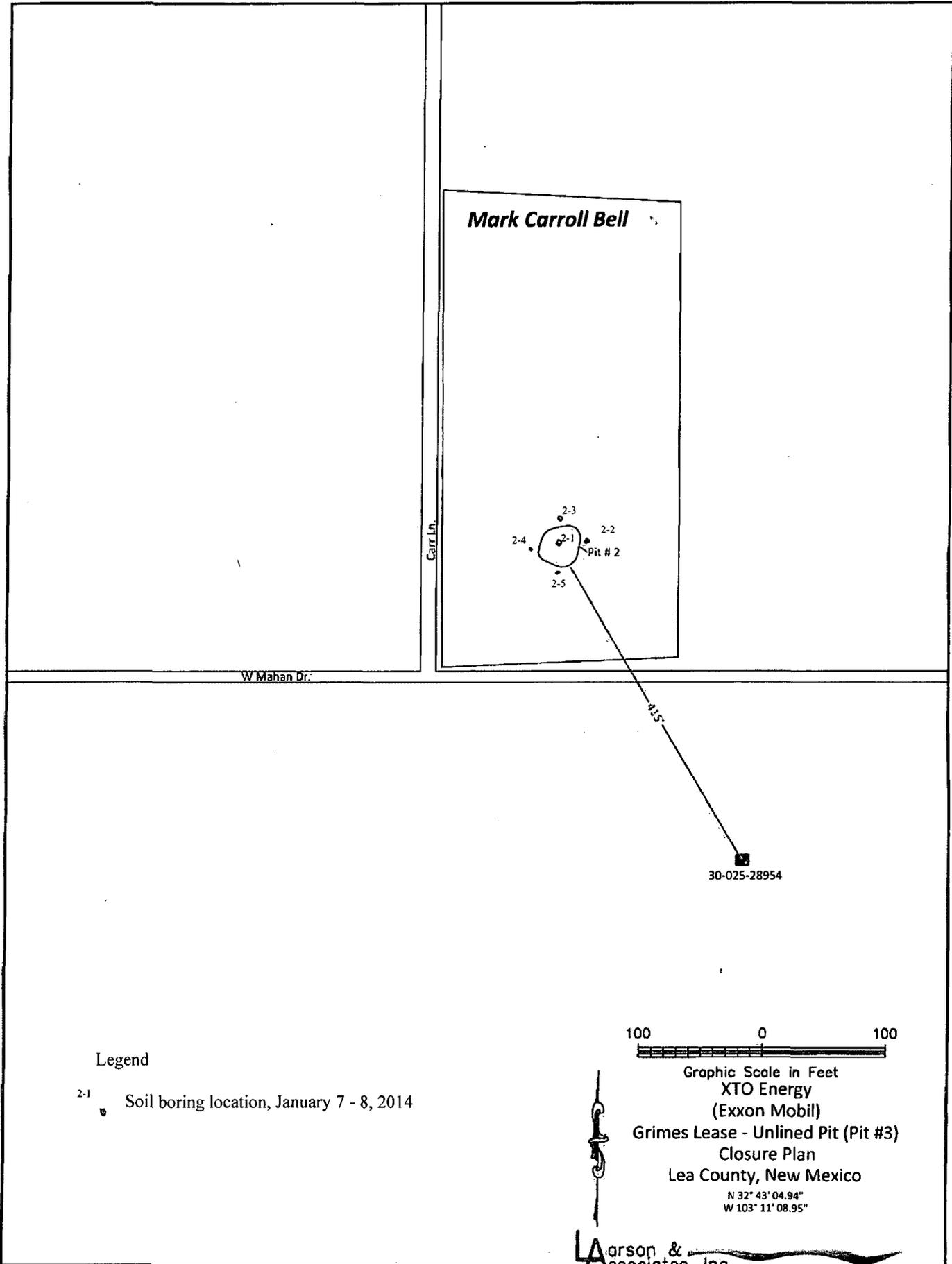


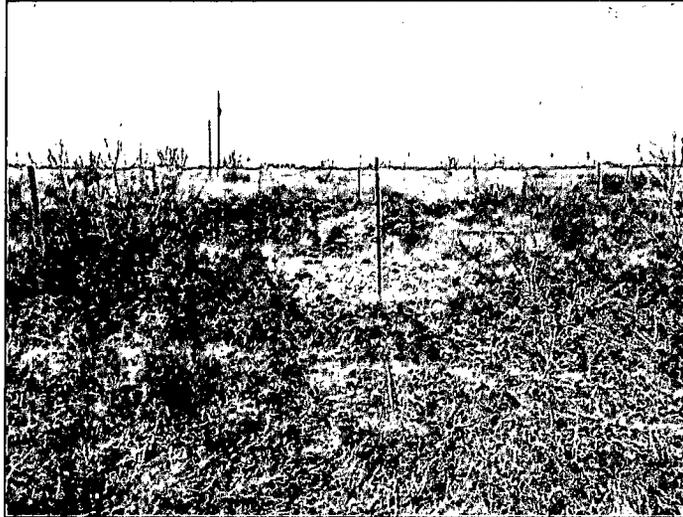
Figure 3 - Site Map

**ATTACHMENT A**

**Photographs**

**Photo:** Pit #2 before excavation commenced

**Direction:** East



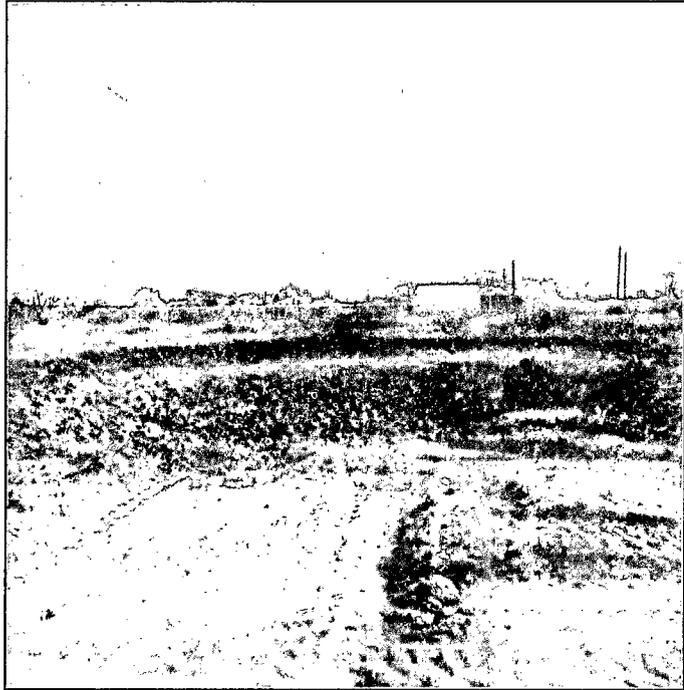
**Photo:** Pit during excavation

**Direction:** West



**Photo:** Excavation limits of pit

**Direction:** East



**Photo:** Sloped entrance and benched sides of the pit.

**Direction:** East



**ATTACHMENT B**

**Laboratory Reports**



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

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January 14, 2014

MARK LARSON

LARSON & ASSOCIATES, INC.

507 N. MARIENFELD, SUITE 200

MIDLAND, TX 79701

RE: GRIMES PIT #2

Enclosed are the results of analyses for samples received by the laboratory on 01/07/14 15:50.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, prominent initial "C".

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/07/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/07/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-1-10' (H400046-01)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Benzene*</b>	<b>0.253</b>	0.100	01/10/2014	ND	1.92	96.1	2.00	2.06		
<b>Toluene*</b>	<b>0.678</b>	0.100	01/10/2014	ND	1.89	94.6	2.00	2.20		
<b>Ethylbenzene*</b>	<b>2.37</b>	0.100	01/10/2014	ND	1.93	96.4	2.00	2.32		
<b>Total Xylenes*</b>	<b>3.63</b>	0.300	01/10/2014	ND	5.63	93.8	6.00	2.42		
<b>Total BTEX</b>	<b>6.93</b>	0.600	01/10/2014	ND						

Surrogate: 4-Bromofluorobenzene (PIE) 93.5 % 89.4-126

TPH 8015M		mg/kg		Analyzed By: ms							S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
<b>GRO C6-C10</b>	<b>161</b>	10.0	01/09/2014	ND	176	88.0	200	2.61			
<b>DRO &gt;C10-C28</b>	<b>1150</b>	10.0	01/09/2014	ND	178	89.2	200	1.68			
<b>EXT DRO &gt;C28-C35</b>	<b>245</b>	10.0	01/09/2014	ND							

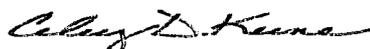
Surrogate: 1-Chlorooctane 41.5 % 65.2-140

Surrogate: 1-Chlorooctadecane 57.3 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/07/2014	Sampling Date:	01/07/2014
Reported:	01/14/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-1-15' (H400046-02)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>79.5</b>	50.0	01/08/2014	ND	176	88.0	200	2.61	
<b>DRO &gt;C10-C28</b>	<b>1040</b>	50.0	01/08/2014	ND	178	89.2	200	1.68	
<b>EXT DRO &gt;C28-C35</b>	<b>228</b>	50.0	01/08/2014	ND					
<hr/>									
<i>Surrogate: 1-Chlorooctane</i>	<i>70.0 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>122 %</i>	<i>63.6-154</i>							

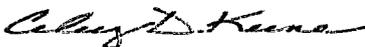
**Sample ID: 2-1-20' (H400046-03)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>94.7</b>	50.0	01/08/2014	ND	176	88.0	200	2.61	
<b>DRO &gt;C10-C28</b>	<b>1360</b>	50.0	01/08/2014	ND	178	89.2	200	1.68	
<b>EXT DRO &gt;C28-C35</b>	<b>261</b>	50.0	01/08/2014	ND					
<hr/>									
<i>Surrogate: 1-Chlorooctane</i>	<i>79.3 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>132 %</i>	<i>63.6-154</i>							

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/07/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/07/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-1-25' (H400046-04)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	740	100	01/08/2014	ND	176	88.0	200	2.61		
DRO >C10-C28	4030	100	01/08/2014	ND	178	89.2	200	1.68		
EXT DRO >C28-C35	689	100	01/08/2014	ND						

Surrogate: 1-Chlorooctane 103 % 65.2-140

Surrogate: 1-Chlorooctadecane 153 % 63.6-154

**Sample ID: 2-1-30' (H400046-05)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	248	50.0	01/08/2014	ND	176	88.0	200	2.61		
DRO >C10-C28	1740	50.0	01/08/2014	ND	178	89.2	200	1.68		
EXT DRO >C28-C35	322	50.0	01/08/2014	ND						

Surrogate: 1-Chlorooctane 91.4 % 65.2-140

Surrogate: 1-Chlorooctadecane 135 % 63.6-154

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\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/07/2014	Sampling Date:	01/07/2014
Reported:	01/14/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-1-40' (H400046-06)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	111	50.0	01/08/2014	ND	176	88.0	200	2.61		
DRO >C10-C28	1890	50.0	01/08/2014	ND	178	89.2	200	1.68		
EXT DRO >C28-C35	386	50.0	01/08/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	98.2 %	65.2-140								
Surrogate: 1-Chlorooctadecane	143 %	63.6-154								

**Sample ID: 2-1-50' (H400046-07)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	78.8	10.0	01/08/2014	ND	176	88.0	200	2.61		
DRO >C10-C28	690	10.0	01/08/2014	ND	178	89.2	200	1.68		
EXT DRO >C28-C35	116	10.0	01/08/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	93.8 %	65.2-140								
Surrogate: 1-Chlorooctadecane	88.2 %	63.6-154								

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/07/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/07/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-5-5' (H400046-08)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/08/2014	ND	176	88.0	200	2.61	
<b>DRO &gt;C10-C28</b>	<b>39.6</b>	10.0	01/08/2014	ND	178	89.2	200	1.68	
<b>EXT DRO &gt;C28-C35</b>	<b>17.1</b>	10.0	01/08/2014	ND					
<hr/>									
<i>Surrogate: 1-Chlorooctane</i>	<i>71.6 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>74.4 %</i>	<i>63.6-154</i>							

**Sample ID: 2-5-10' (H400046-09)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/09/2014	ND	176	88.0	200	2.61	
DRO >C10-C28	<10.0	10.0	01/09/2014	ND	178	89.2	200	1.68	
EXT DRO >C28-C35	<10.0	10.0	01/09/2014	ND					
<hr/>									
<i>Surrogate: 1-Chlorooctane</i>	<i>78.6 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>78.5 %</i>	<i>63.6-154</i>							

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\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/07/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/07/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-5-15' (H400046-10)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/09/2014	ND	176	88.0	200	2.61		
DRO >C10-C28	<10.0	10.0	01/09/2014	ND	178	89.2	200	1.68		
EXT DRO >C28-C35	<10.0	10.0	01/09/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	76.8 %	65.2-140								
Surrogate: 1-Chlorooctadecane	77.6 %	63.6-154								

**Sample ID: 2-5-20' (H400046-11)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/09/2014	ND	176	88.0	200	2.61		
DRO >C10-C28	<10.0	10.0	01/09/2014	ND	178	89.2	200	1.68		
EXT DRO >C28-C35	<10.0	10.0	01/09/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	92.8 %	65.2-140								
Surrogate: 1-Chlorooctadecane	89.7 %	63.6-154								

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/07/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/07/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-5-25' (H400046-12)**

BTEX 8021B		mg/kg		Analyzed By: MS				S-04		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.500	0.500	01/10/2014	ND	1.92	96.1	2.00	2.06		
Toluene*	<0.500	0.500	01/10/2014	ND	1.89	94.6	2.00	2.20		
Ethylbenzene*	<b>3.45</b>	0.500	01/10/2014	ND	1.93	96.4	2.00	2.32		
<b>Total Xylenes*</b>	<b>17.0</b>	1.50	01/10/2014	ND	5.63	93.8	6.00	2.42		
<b>Total BTEX</b>	<b>20.4</b>	3.00	01/10/2014	ND						

Surrogate: 4-Bromofluorobenzene (PIE) 135 % 89.4-126

TPH 8015M		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>370</b>	50.0	01/09/2014	ND	176	88.0	200	2.61		
<b>DRO &gt;C10-C28</b>	<b>1590</b>	50.0	01/09/2014	ND	178	89.2	200	1.68		
<b>EXT DRO &gt;C28-C35</b>	<b>242</b>	50.0	01/09/2014	ND						

Surrogate: 1-Chlorooctane 114 % 65.2-140

Surrogate: 1-Chlorooctadecane 134 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/07/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/07/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-5-30' (H400046-13)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>108</b>	50.0	01/09/2014	ND	176	88.0	200	2.61	
<b>DRO &gt;C10-C28</b>	<b>1520</b>	50.0	01/09/2014	ND	178	89.2	200	1.68	
<b>EXT DRO &gt;C28-C35</b>	<b>264</b>	50.0	01/09/2014	ND					
<hr/>									
Surrogate: 1-Chlorooctane	92.3 %	65.2-140							
Surrogate: 1-Chlorooctadecane	137 %	63.6-154							

**Sample ID: 2-5-40' (H400046-14)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>65.3</b>	50.0	01/09/2014	ND	176	88.0	200	2.61	
<b>DRO &gt;C10-C28</b>	<b>992</b>	50.0	01/09/2014	ND	178	89.2	200	1.68	
<b>EXT DRO &gt;C28-C35</b>	<b>188</b>	50.0	01/09/2014	ND					
<hr/>									
Surrogate: 1-Chlorooctane	84.4 %	65.2-140							
Surrogate: 1-Chlorooctadecane	115 %	63.6-154							

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/07/2014	Sampling Date:	01/07/2014
Reported:	01/14/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-5-50' (H400046-15)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>105</b>	100	01/09/2014	ND	176	88.0	200	2.61	
<b>DRO &gt;C10-C28</b>	<b>1990</b>	100	01/09/2014	ND	178	89.2	200	1.68	
<b>EXT DRO &gt;C28-C35</b>	<b>374</b>	100	01/09/2014	ND					
<i>Surrogate: 1-Chlorooctane</i>	<i>96.8 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>154 %</i>	<i>63.6-154</i>							

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- S-04            The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- ND             Analyte NOT DETECTED at or above the reporting limit
- RPD            Relative Percent Difference
- \*\*              Samples not received at proper temperature of 6°C or below.
- \*\*\*             Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

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---

Celey D. Keene, Lab Director/Quality Manager





January 15, 2014

MARK LARSON

LARSON & ASSOCIATES, INC.

507 N. MARIENFELD, SUITE 200

MIDLAND, TX 79701

RE: GRIMES PIT #2

Enclosed are the results of analyses for samples received by the laboratory on 01/08/14 12:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style.

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To:

 Received: 01/08/2014  
 Reported: 01/15/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-4-5' (H400052-01)**

TPH 8015M	mg/kg		Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/09/2014	ND	176	88.2	200	7.91		
DRO >C10-C28	<10.0	10.0	01/09/2014	ND	178	89.2	200	7.01		
EXT DRO >C28-C35	<10.0	10.0	01/09/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	76.2 %	65.2-140								
Surrogate: 1-Chlorooctadecane	74.7 %	63.6-154								

**Sample ID: 2-4-10' (H400052-02)**

TPH 8015M	mg/kg		Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/09/2014	ND	176	88.2	200	7.91		
<b>DRO &gt;C10-C28</b>	<b>51.0</b>	10.0	01/09/2014	ND	178	89.2	200	7.01		
<b>EXT DRO &gt;C28-C35</b>	<b>21.4</b>	10.0	01/09/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	76.4 %	65.2-140								
Surrogate: 1-Chlorooctadecane	83.9 %	63.6-154								

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\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/15/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-4-15' (H400052-03)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/10/2014	ND	176	88.2	200	7.91		
DRO >C10-C28	<10.0	10.0	01/10/2014	ND	178	89.2	200	7.01		
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND						
<hr/>										
<i>Surrogate: 1-Chlorooctane</i>	<i>87.4 %</i>	<i>65.2-140</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>84.9 %</i>	<i>63.6-154</i>								

**Sample ID: 2-4-20' (H400052-04)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/09/2014	ND	176	88.2	200	7.91		
DRO >C10-C28	<10.0	10.0	01/09/2014	ND	178	89.2	200	7.01		
EXT DRO >C28-C35	<10.0	10.0	01/09/2014	ND						
<hr/>										
<i>Surrogate: 1-Chlorooctane</i>	<i>79.1 %</i>	<i>65.2-140</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>77.9 %</i>	<i>63.6-154</i>								

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/08/2014	Sampling Date:	01/08/2014
Reported:	01/15/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-4-25' (H400052-05)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<50.0	50.0	01/09/2014	ND	176	88.2	200	7.91		
<b>DRO &gt;C10-C28</b>	<b>700</b>	50.0	01/09/2014	ND	178	89.2	200	7.01		
<b>EXT DRO &gt;C28-C35</b>	<b>115</b>	50.0	01/09/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	70.9 %	65.2-140								
Surrogate: 1-Chlorooctadecane	111 %	63.6-154								

**Sample ID: 2-4-30' (H400052-06)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<b>68.5</b>	50.0	01/09/2014	ND	176	88.2	200	7.91		
<b>DRO &gt;C10-C28</b>	<b>1210</b>	50.0	01/09/2014	ND	178	89.2	200	7.01		
<b>EXT DRO &gt;C28-C35</b>	<b>204</b>	50.0	01/09/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	96.8 %	65.2-140								
Surrogate: 1-Chlorooctadecane	134 %	63.6-154								

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/15/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-4-40' (H400052-07)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>62.8</b>	50.0	01/09/2014	ND	176	88.2	200	7.91		
<b>DRO &gt;C10-C28</b>	<b>1270</b>	50.0	01/09/2014	ND	178	89.2	200	7.01		
<b>EXT DRO &gt;C28-C35</b>	<b>247</b>	50.0	01/09/2014	ND						

Surrogate: 1-Chlorooctane 95.8 % 65.2-140

Surrogate: 1-Chlorooctadecane 137 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/15/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-4-50' (H400052-08)**

BTEX 8021B		mg/kg		Analyzed By: MS				S-04		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.100	0.100	01/13/2014	ND	2.09	105	2.00	3.68		
<b>Toluene*</b>	<b>0.154</b>	0.100	01/13/2014	ND	2.06	103	2.00	3.76		
<b>Ethylbenzene*</b>	<b>0.863</b>	0.100	01/13/2014	ND	2.10	105	2.00	3.52		
<b>Total Xylenes*</b>	<b>1.85</b>	0.300	01/13/2014	ND	6.12	102	6.00	3.11		
<b>Total BTEX</b>	<b>2.86</b>	0.600	01/13/2014	ND						

Surrogate: 4-Bromofluorobenzene (PIC) 167 % 89.4-126

TPH 8015M		mg/kg		Analyzed By: ms				S-04		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>134</b>	10.0	01/10/2014	ND	211	106	200	0.499		
<b>DRO &gt;C10-C28</b>	<b>2690</b>	10.0	01/10/2014	ND	218	109	200	2.11		
<b>EXT DRO &gt;C28-C35</b>	<b>461</b>	10.0	01/10/2014	ND						

Surrogate: 1-Chlorooctane 176 % 65.2-140

Surrogate: 1-Chlorooctadecane 209 % 63.6-154

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/08/2014	Sampling Date:	01/08/2014
Reported:	01/15/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-3-5' (H400052-09)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/10/2014	ND	211	106	200	0.499		
DRO >C10-C28	<10.0	10.0	01/10/2014	ND	218	109	200	2.11		
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	87.0 %	65.2-140								
Surrogate: 1-Chlorooctadecane	86.4 %	63.6-154								

**Sample ID: 2-3-10' (H400052-10)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/10/2014	ND	211	106	200	0.499		
DRO >C10-C28	<10.0	10.0	01/10/2014	ND	218	109	200	2.11		
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND						
<hr/>										
Surrogate: 1-Chlorooctane	96.2 %	65.2-140								
Surrogate: 1-Chlorooctadecane	92.7 %	63.6-154								

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/08/2014	Sampling Date:	01/08/2014
Reported:	01/15/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-3-15' (H400052-11)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/10/2014	ND	211	106	200	0.499		
DRO >C10-C28	<10.0	10.0	01/10/2014	ND	218	109	200	2.11		
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND						
<hr/>										
<i>Surrogate: 1-Chlorooctane</i>	92.3 %	65.2-140								
<i>Surrogate: 1-Chlorooctadecane</i>	94.4 %	63.6-154								

**Sample ID: 2-3-20' (H400052-12)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/10/2014	ND	211	106	200	0.499		
DRO >C10-C28	<10.0	10.0	01/10/2014	ND	218	109	200	2.11		
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND						
<hr/>										
<i>Surrogate: 1-Chlorooctane</i>	92.9 %	65.2-140								
<i>Surrogate: 1-Chlorooctadecane</i>	101 %	63.6-154								

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/15/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-3-25' (H400052-13)**

BTEX 8021B		mg/kg		Analyzed By: MS				S-04		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.200	0.200	01/13/2014	ND	2.09	105	2.00	3.68		
Toluene*	<b>0.283</b>	0.200	01/13/2014	ND	2.06	103	2.00	3.76		
Ethylbenzene*	<b>2.20</b>	0.200	01/13/2014	ND	2.10	105	2.00	3.52		
Total Xylenes*	<b>10.8</b>	0.600	01/13/2014	ND	6.12	102	6.00	3.11		
Total BTEX	<b>13.3</b>	1.20	01/13/2014	ND						

Surrogate: 4-Bromofluorobenzene (PIL) 166 % 89.4-126

TPH 8015M		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<b>201</b>	10.0	01/10/2014	ND	211	106	200	0.499		
DRO >C10-C28	<b>1180</b>	10.0	01/10/2014	ND	218	109	200	2.11		
EXT DRO >C28-C35	<b>179</b>	10.0	01/10/2014	ND						

Surrogate: 1-Chlorooctane 123 % 65.2-140

Surrogate: 1-Chlorooctadecane 111 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/15/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-3-30' (H400052-14)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	168	10.0	01/10/2014	ND	211	106	200	0.499	
DRO >C10-C28	1700	10.0	01/10/2014	ND	218	109	200	2.11	
EXT DRO >C28-C35	294	10.0	01/10/2014	ND					
<hr/>									
Surrogate: 1-Chlorooctane	126 %	65.2-140							
Surrogate: 1-Chlorooctadecane	148 %	63.6-154							

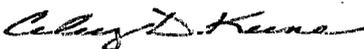
**Sample ID: 2-3-40' (H400052-15)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	89.1	10.0	01/10/2014	ND	211	106	200	0.499	
DRO >C10-C28	1350	10.0	01/10/2014	ND	218	109	200	2.11	
EXT DRO >C28-C35	249	10.0	01/10/2014	ND					
<hr/>									
Surrogate: 1-Chlorooctane	114 %	65.2-140							
Surrogate: 1-Chlorooctadecane	114 %	63.6-154							

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/08/2014	Sampling Date:	01/08/2014
Reported:	01/15/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-3-50' (H400052-16)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>172</b>	10.0	01/10/2014	ND	211	106	200	0.499		
<b>DRO &gt;C10-C28</b>	<b>2010</b>	10.0	01/10/2014	ND	218	109	200	2.11		
<b>EXT DRO &gt;C28-C35</b>	<b>368</b>	10.0	01/10/2014	ND						
<i>Surrogate: 1-Chlorooctane</i>	<i>135 %</i>	<i>65.2-140</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>130 %</i>	<i>63.6-154</i>								

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- S-04            The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- ND             Analyte NOT DETECTED at or above the reporting limit
- RPD            Relative Percent Difference
- \*\*             Samples not received at proper temperature of 6°C or below.
- \*\*\*            Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
               Samples reported on an as received basis (wet) unless otherwise noted on report

---

Cardinal Laboratories

\*=Accredited Analyte

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---

Celey D. Keene, Lab Director/Quality Manager

**Arson & Associates, Inc.**  
Environmental Consultants

507 N. Marienfeld, Ste. 200  
Midland, TX 79701  
432-687-0901

DATE: 1/8/14 PAGE 1 OF 1  
PO #: 12-0148-03 LAB WORK ORDER #: H40005  
PROJECT LOCATION OR NAME: Grimes Pit #2  
LAI PROJECT #: 12-0148-03 COLLECTOR: AND

Data Reported to:

TRRP report?  
 Yes  No

S=SOIL P=PAINT  
W=WATER SL=SLUDGE  
A=AIR OT=OTHER

PRESERVATION

HCl HNO<sub>3</sub> H<sub>2</sub>SO<sub>4</sub> NaOH  
ICE UNPRESERVED

- ANALYSES**
- BTEX
  - MTBE
  - TPH 418-1
  - TPH 1005
  - DIESEL - MOD 8015
  - VOC 8260
  - SVOC 8270
  - PAH 8270
  - 8082 PESTICIDES
  - PCBs
  - TOLP - METALS
  - TOLP - PEST
  - HOLDPAH
  - 8151 HERBICIDES
  - TOTAL METALS (RCRA)
  - LEAD - TOTAL
  - RQL
  - TOX
  - TDS
  - pH
  - EXPLOSIVES
  - CHLORIDE
  - SEMI-VOC
  - OTHER VOC
  - D.W. 200.8
  - FLASHPOINT
  - % MOISTURE
  - CHROMIUM
  - PECHLORATE
  - ANIONS
  - ALKALINITY

FIELD NOTES

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
1 2-4-5'		1/8	930	S	1					X		X	Straight from field
2 2-4-10'			935										
3 2-4-15'			940										
4 2-4-20'			942										
5 2-4-25'			950										
6 2-4-30'			1000										
7 2-4-40'			1005										
8 2-4-50'			1020								X		
9 2-3-5'			1040										
10 2-3-10'			1045										
11 2-3-15'			1050										
12 2-3-20'			1052										
13 2-3-25'			1100								X		
14 2-3-30'			1102										
15 2-3-40'			1105										

TOTAL 12-30

RELINQUISHED BY: (Signature) <u>Adriana</u>	DATE/TIME <u>1/8/14</u>	RECEIVED BY: (Signature) <u>Jodi Henson</u>
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)

TURN AROUND TIME  
 NORMAL  
 1 DAY  
 2 DAY  
 OTHER

LABORATORY USE ONLY:  
 RECEIVING TEMP: 4.80c THERM #: 54  
 CUSTODY SEALS -  BROKEN  INTACT  NOT USED  
 CARRIER BILL # \_\_\_\_\_  
 HAND DELIVERED





January 14, 2014

MARK LARSON

LARSON & ASSOCIATES, INC.

507 N. MARIENFELD, SUITE 200

MIDLAND, TX 79701

RE: GRIMES PIT #2

Enclosed are the results of analyses for samples received by the laboratory on 01/08/14 15:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/ga/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/ga/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is fluid and cursive.

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-2-5' (H400059-01)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/10/2014	ND	211	106	200	0.499	
<b>DRO &gt;C10-C28</b>	<b>56.7</b>	10.0	01/10/2014	ND	218	109	200	2.11	
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND					
<hr/>									
Surrogate: 1-Chlorooctane	120 %	65.2-140							
Surrogate: 1-Chlorooctadecane	136 %	63.6-154							

**Sample ID: 2-2-10' (H400059-02)**

TPH 8015M	mg/kg	Analyzed By: ms							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/10/2014	ND	190	94.8	200	1.69	
DRO >C10-C28	<10.0	10.0	01/10/2014	ND	195	97.7	200	2.06	
EXT DRO >C28-C35	<10.0	10.0	01/10/2014	ND					
<hr/>									
Surrogate: 1-Chlorooctane	82.5 %	65.2-140							
Surrogate: 1-Chlorooctadecane	89.3 %	63.6-154							

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-2-15' (H400059-03)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/11/2014	ND	190	94.8	200	1.69		
DRO >C10-C28	<10.0	10.0	01/11/2014	ND	195	97.7	200	2.06		
EXT DRO >C28-C35	<10.0	10.0	01/11/2014	ND						
<hr/>										
<i>Surrogate: 1-Chlorooctane</i>	<i>136 %</i>	<i>65.2-140</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>152 %</i>	<i>63.6-154</i>								

**Sample ID: 2-2-20' (H400059-04)**

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/11/2014	ND	190	94.8	200	1.69		
DRO >C10-C28	<10.0	10.0	01/11/2014	ND	195	97.7	200	2.06		
EXT DRO >C28-C35	<10.0	10.0	01/11/2014	ND						
<hr/>										
<i>Surrogate: 1-Chlorooctane</i>	<i>85.6 %</i>	<i>65.2-140</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>95.1 %</i>	<i>63.6-154</i>								

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

Received:	01/08/2014	Sampling Date:	01/08/2014
Reported:	01/14/2014	Sampling Type:	Soil
Project Name:	GRIMES PIT #2	Sampling Condition:	Cool & Intact
Project Number:	12-0140-03	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

**Sample ID: 2-2-25' (H400059-05)**

BTEX 8021B	mg/kg	Analyzed By: MS				S-04				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.200	0.200	01/13/2014	ND	2.09	105	2.00	3.68		
Toluene*	<0.200	0.200	01/13/2014	ND	2.06	103	2.00	3.76		
Ethylbenzene*	<b>0.352</b>	0.200	01/13/2014	ND	2.10	105	2.00	3.52		
<b>Total Xylenes*</b>	<b>1.96</b>	0.600	01/13/2014	ND	6.12	102	6.00	3.11		
<b>Total BTEX</b>	<b>2.31</b>	1.20	01/13/2014	ND						

Surrogate: 4-Bromofluorobenzene (PIC) 133 % 89.4-126

TPH 8015M	mg/kg	Analyzed By: ms								
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>160</b>	50.0	01/11/2014	ND	190	94.8	200	1.69		
<b>DRO &gt;C10-C28</b>	<b>1720</b>	50.0	01/11/2014	ND	195	97.7	200	2.06		
<b>EXT DRO &gt;C28-C35</b>	<b>239</b>	50.0	01/11/2014	ND						

Surrogate: 1-Chlorooctane 107 % 65.2-140

Surrogate: 1-Chlorooctadecane 146 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ? --

 Received: 01/08/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-2-30' (H400059-06)**

TPH 8015M	mg/kg	Analyzed By: ms				S-06				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	130	50.0	01/11/2014	ND	190	94.8	200	1.69		
DRO >C10-C28	2080	50.0	01/11/2014	ND	195	97.7	200	2.06		
EXT DRO >C28-C35	334	50.0	01/11/2014	ND						

Surrogate: 1-Chlorooctane 117 % 65.2-140  
 Surrogate: 1-Chlorooctadecane 169 % 63.6-154

**Sample ID: 2-2-40' (H400059-07)**

TPH 8015M	mg/kg	Analyzed By: ms				S-06				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<50.0	50.0	01/11/2014	ND	190	94.8	200	1.69		
DRO >C10-C28	787	50.0	01/11/2014	ND	195	97.7	200	2.06		
EXT DRO >C28-C35	92.5	50.0	01/11/2014	ND						

Surrogate: 1-Chlorooctane 88.5 % 65.2-140  
 Surrogate: 1-Chlorooctadecane 124 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 LARSON & ASSOCIATES, INC.  
 MARK LARSON  
 507 N. MARIENFELD, SUITE 200  
 MIDLAND TX, 79701  
 Fax To: ?

 Received: 01/08/2014  
 Reported: 01/14/2014  
 Project Name: GRIMES PIT #2  
 Project Number: 12-0140-03  
 Project Location: LEA COUNTY, NM

 Sampling Date: 01/08/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: 2-2-50' (H400059-08)**

TPH 8015M	mg/kg	Analyzed By: ms					S-06			
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	64.8	50.0	01/11/2014	ND	190	94.8	200	1.69		
DRO >C10-C28	1590	50.0	01/11/2014	ND	195	97.7	200	2.06		
EXT DRO >C28-C35	272	50.0	01/11/2014	ND						
Surrogate: 1-Chlorooctane	128 %	65.2-140								
Surrogate: 1-Chlorooctadecane	165 %	63.6-154								

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- S-06 The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

