**APPROVED** 

# 1RP-4049 FINAL REMEDIATION REPORT Perla Negra Fed Com #4H Well Release

Lea County, New Mexico

LAI Project No. 15-0167-01

September 1, 2016

Prepared for:

XTO Energy, Inc. 500 West Illinois Street, Suite 100 Midland, Texas 79707

Prepared by:

Larson & Associates, Inc. 507 North Marienfeld Street, Suite 205 Midland, Texas 79701

Mark J. Larson, P.G.

Certified Professional Geologist #10490





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#### Introduction

This report is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of XTO Energy, Inc. (XTO) to present the remediation of residual hydrocarbons in the right-of-way (ROW) for three (3) fiber optic cables owned by AT&T. The hydrocarbons are the result of a release from the Perla Negra Fed Com Well #4H (Site) located north on the ROW. The Site is located in Unit A (NE/4, NE/4), Section 25, Township 19 South, Range 34 East, in Lea County, New Mexico. The approximate geodetic position is north 32° 38′ 16.3055″ and west 103° 30′ 24.8432″. Figure 1 presents a topographic map. Figure 2 presents an aerial map. Figure 2a presents a focused aerial map.

#### Background

The release occurred on December 1, 2015 during well swabbing operations that caused crude oil and water to escape from the wellhead. The estimated volume of the release was approximately 301.3 barrels (bbl) oil and 192.8 mcf gas. Approximately 158.63 bbl of fluid was recovered. XTO verbally notified the U.S. Bureau of Land Management (BLM) in Carlsbad, New Mexico. On December 21, 2015, the initial C-141 was submitted to the New Mexico Oil Conservation Division (OCD) District 1 in Hobbs, New Mexico. The OCD assigned the release remediation permit number 1RP-4049.

During December 2015 and January 2016, LAI personnel applied Micro-Blaze microbial amendment (6%) to the affected area (red zone). On January 28, 2016, LAI personnel collected discrete samples at twenty-two (22) locations (S-1 through S-22) including three samples (S-5, S-6 and S-7) from the ROW and eleven (11) composite samples. The samples were collected with a stainless steel hand auger from 0 to 1 and 1 to 2 feet below ground surface (bgs). The samples were analyzed by Trace Analysis, Inc. (Trace), in Midland, Texas, for total petroleum hydrocarbons (TPH) by EPA SW-846 method 8015 including gasoline (GRO) and diesel (DRO) range organics and chloride by method 300. The laboratory reported TPH above the OCD recommended remediation action level (RRAL) of 1,000 milligrams per kilogram (mg/Kg) in discrete samples S-7, 0 to 1 foot (9,180 mg/kg) and S-7, 1 to 2 feet (7,030 mg/Kg). Chloride was below 250 mg/Kg. Figure 3 presents a sample location map.

On April 26, 2016, following another application of Micro-Blaze to the area around S-7, LAI personnel collected samples to about eight (8) feet below ground surface (bgs) using direct push sampling methods. Trace analyzed the samples for TPH by EPA SW-846-Method 8015 and reported 9,018 mg/Kg, 5,120 mg/Kg and 316 mg/Kg, in samples from 0 to 1, 1 to 2 and 2 to 3 feet bgs, respectively. TPH in the remaining samples was below the method reporting limit (RL). The initial remediation was presented to the OCD and BLM on June 16, 2016, in a report titled, "Remediation Report Perla Negra Fed Com Well #4H, Lea County, New Mexico, 1RP-4049". The report recommended natural attenuation for the residual hydrocarbons in the vicinity of sample S-7. OCD denied the request for natural attenuation on June 16, 2016.

On June 24, 2016, XTO and LAI personnel met with AT&T representatives to determine what remediation, if any, that AT&T would allow in the ROW. Due to the shallowest fiber optic cable buried

at approximately 25 inches bgs AT&T personnel agreed that bioremediation and tilling was an acceptable remediation approach. On July 13, 2016, LAI on behalf of XTO submitted a remediation plan to OCD and BLM that proposed treating the soil with a microbial amendment (M-1000H) and nutrient (OSNF #1) manufactured by Micro-Bac International, Inc., in Round Rock, Texas, followed by tilling and periodic wetting with potable water. The remediation plan was approved on July 18, 2016 (OCD) and 19, 2016 (BLM). Figure 4 presents the remediation area. Appendix A presents the remediation plan approval.

#### Setting

The setting is as follows:

- The surface elevation is about 3,780 feet above mean sea level (MSL);
- The topography is undulating with the regional topographic slope to the southeast;
- The nearest surface water feature is a small playa located about 2 miles northeast of the Site with no surface connection to the Site;
- The dominant soil types are "Pyote soils and dune land" (29.2%), "Kermit-Palomas fine sands, 0 to 12 percent slopes" (20%) and "Simona fine sandy loam, 0 to 3 percent slopes" (18.3%). The soils are fine sandy and calcareous eolian deposits derived from sedimentary rock;
- The upper geologic unit is the Tertiary-age Ogallala formation consisting of unconsolidated to semi-consolidated fine to coarse grained quartz sand, silt, gravel and clay and underlain by the Triassic-age Chinle formation of the Dockum group;
- The nearest fresh water well (CP 8941) is located about 2,000 feet northeast in Unit M (SW/4, SW/4), Section 19, Township 19 South and Range 35 East. Depth to groundwater is reported at 285 feet below ground surface (bgs);
- Groundwater was encountered at 55 feet below ground surface (bgs) in a boring drilled near the northwest corner of the Site.

#### **Remediation Action Levels**

Remediation action levels (RRAL) were calculated for benzene, BTEX and TPH based on the following criteria established by the OCD (*Guidelines for Remediation of Leaks, Spills and Releases, August 13,* 1993):

Criteria	Result	Score
Depth-to-Groundwater	50 - 100 feet	10
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 10

Benzene

10 mg/Kg

BTEX

50 mg/Kg

TPH

1,000 mg/Kg

#### **Additional Remediation**

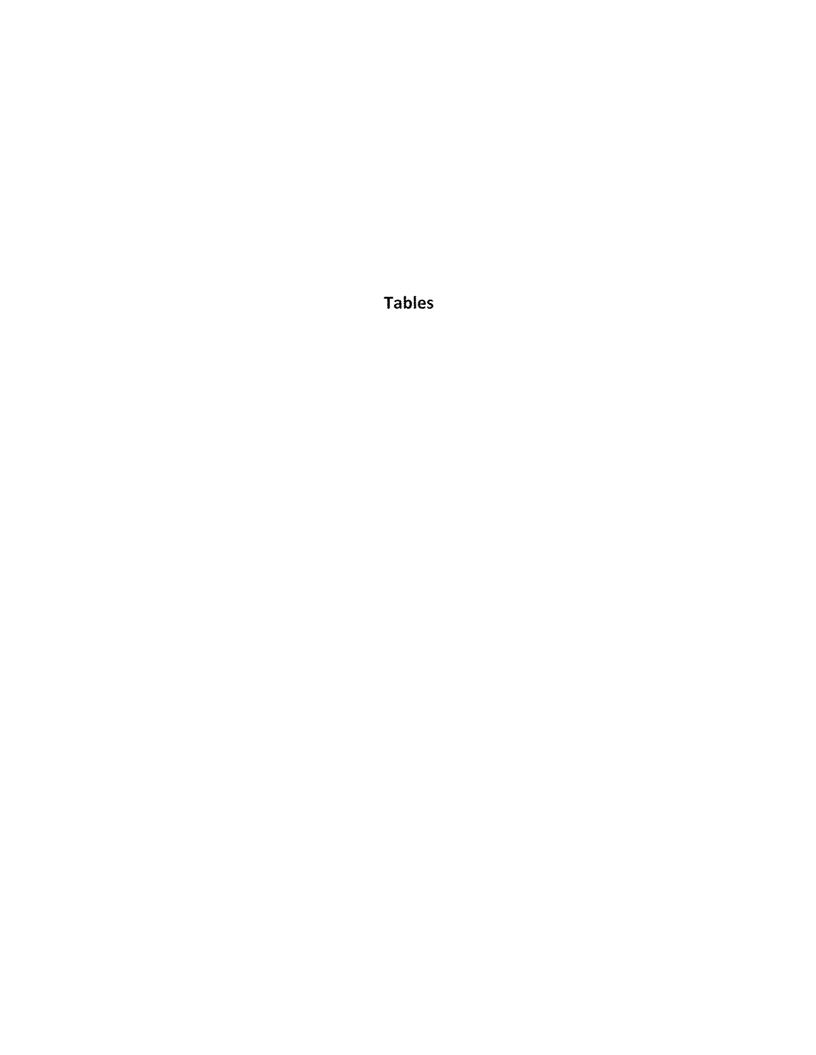
On August 8, 2016, LAI personnel applied the liquid M-1000H microbial amendment and granular OSNF nutrient to the soil followed by tilling and watering. The M-1000H and OSNF was applied to an area measuring approximately 7,986 square feet to treat approximately 15,972 cubic feet of soil. The treated area was tilled for aeration and watered to maintain moisture.

On August 19 and 26, 2016, LAI personnel used a stainless steel hand auger to collect soil samples near S-7 from 0 to 1 and 1 to 2 feet bgs, respectively. Trace analyzed the samples for TPH by EPA SW-846 method 8015 including GRO and DRO. Table 1 presents the analytical data summary. Appendix B presents the laboratory reports.

Referring to Table 1, the laboratory reported 3,776 mg/Kg TPH in the sample from 0 to 1 foot and 4,090 mg/Kg TPH in the sample from 1 to 2 feet. The TPH concentration in the sample from 0 to 1 foot shows an approximate 60 percent decrease from the initial concentration (9,180 mg/Kg). The TPH concentration in the sample from 1 to 2 feet shows an approximate 42 percent decrease from the initial concentration (7,030 mg/Kg).

#### Conclusion

The bioremediation has significantly reduced the TPH concentration and will continue to decrease over time. XTO proposes a final application of M-1000H and OSNF #1 followed by one round of tilling and watering to remediate the remaining hydrocarbons. The surface will be restored to BLM and AT&T requirements. Your approval of this final remediation report is requested. Appendix C presents photographs. Appendix D presents the initial and final C-141.



XTO Energy, Inc., Perla Negra #4 Well Release Unit A (NE/4, NE/4), Section 25, Township 19 South, Range 34 East Lea County, New Mexico 1RP-4049 Soil Sample Analytical Data Summary

Sample	Depth	Collection	Status	PID	Benzene	BTEX	DRO	GRO	TPH	Chloride
	(Feet)	Date		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
OCD RRAL:					10	20			1,000	**250
Area: Well Pad	ad									
S-1	0 - 1	1/28/2016	In-Situ	3.8	1 1	:	<50.0	<4.00	<54.0	<b>39.6</b> ∕25.0
	1	1, 20, 2010					0.00/	00.4	0.+0	777.0
S-2	0 - 1	1/28/2016	In-Situ	6.6	1 1	1 1	<50.0	<4.00	<54.0	31.5
	1	7/ 50/ 50 12					2.00	00:	) ;	0.035
S-3	0 - 1	1/28/2016	In-Situ	589	<0.0200	3.022	478	132	<b>610</b> <54.0	1,800
	1	0101/01/1	3				?	9	?	0:03
S-4	0-1	1/28/2016	In-Situ	414	<0.0200	0.4204	<50.0	92.1	92.1	92.9
	1 - 2	1/28/2016	In-Situ	1	I	1	<50.0	<4.00	<54.0	30.5
Area: Right of Way (AT&)	ot Way (AT&									
S-5	0 - 1	1/28/2016	In-Situ	99	1	-	530	<4.00	530	37.2
	1 - 2	1/28/2016	In-Situ	1	1	ı	<50.0	<4.00	<54.0	<25.0
9-8	0-1	1/28/2016	In-Situ	277	00000	0 2609	3///	11.3	355.3	148
,	1-2	1/28/2016	In-Situ				51.6	<4.00	51.6	125
2.7	1-0	1/28/2016	In-Citu	1 070	000	07 460	0000	2 700	0 100	72.7
5	H	4/26/2016	In-Situ	T,0/0	0.200	07.400	8,140	878	9,018	1.57
		8/19/2016	In-Situ	1	1	1	3630	146	3,776	ŀ
	1-2	1/28/2016	In-Situ	1	1	-	4,230	2,800	7,030	50.9
		4/26/2016	In-Situ	!	1	1	4,090	1,030	5,120	ŀ
		8/26/2016	In-Situ	1	1	1	2920	1170	4,090	1
	2-3	2/18/2016	In-Situ	29	<0.0200	<0.0200	316	<50	316	55.4
	3 - 4	2/18/2016	In-Situ	20	<0.0200	<0.0200 0.1852	<50.0	24.00	<54.0	775.0
	5-6	2/18/2016	In-Situ	6	-	1011	<50.0	<4.00	<54.0	36.6
	2 - 9	2/18/2016	In-Situ	4	1	1	<50.0	<4.00	<54.0	29.3
	7 - 8	2/18/2016		2.6	ı	I	ı	1	1	
Area: Red Zone	Zone									

Table 1

# Soil Sample Analytical Data Summary

# XTO Energy, Inc., Perla Negra #4 Well Release Unit A (NE/4, NE/4), Section 25, Township 19 South, Range 34 East Lea County, New Mexico 1RP-4049

S-8	S-9	S-10	S-11	S-12	S-13	S-14	S-15	S-16	S-17	S-18	a: Trans S-19	S-20
0 - 1	0-1	0 - 1	0-1	0 - 1	0-1	0 - 1 1 - 2	0 - 1 1 - 2	0-1	0 - 1	0 - 1	Area: Transition Zone  S-19  0 - 1  1 - 2	0-1
1/28/2016   1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016	1/28/2016 1/28/2016	1/29/2016
In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ In-Situ	In-Situ
0.8	0.0	0.8	0.0	0.8	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0
1 ( 1 1	1 #	1		† ¦	1 1		1 1		1 1	1 1	1 1	
1 ;	3 B E E	1 1		1 1	1 1	1 1	1 1	* I	1 1	i 1		
<50.0 <50.0	<50.0 <50.0	182 <50.0	252 <50.0	<50.0 <50.0	< <u>50.0</u>	<50.0						
<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00 <4.00	<4.00
<54.0 <54.0	<54.0 <54.0	<b>182</b> <54.0	<b>252</b> <54.0	<54.0 <54.0	<54.0							
<25.0 <25.0	<25.0 <25.0	<25.0 <25.0	<b>28.7</b> <25.0	<25.0 <25.0	<25.0							

Table 1

# Unit A (NE/4, NE/4), Section 25, Township 19 South, Range 34 East XTO Energy, Inc., Perla Negra #4 Well Release Soil Sample Analytical Data Summary Lea County, New Mexico

1RP-4049

<25.0	<25.0 <25.0	<25.0 <25.0		<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0
<54.0	<54.0 <54.0	<54.0 <54.0		<54.0	<54.0	<54.0	<54.0	<54.0	<54.0	<54.0	<54.0	<54.0	<54.0	<54.0
<4.00	<4.00 <4.00	<4.00		<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
<50.0	<50.0 <50.0	<50.0		<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
1	1 + 2	1 1		[	đ.	ŀ	1	# #	1	ł	1	ŀ	ł	1
1				-	ŀ	I	ł	{	1	l	1	1	l	1
1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
In-Situ	In-Situ In-Situ	In-Situ In-Situ		In-Situ										
1/29/2016	1/29/2016 1/29/2016	1/29/2016 1/29/2016		1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016	1/29/2016
1.2	0 - 1 1 - 2	0-1	en Zone	0 - 1	0 - 1	0-1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0-1
	S-21	S-22	Area: Green Zone	Comp-1	Comp -2	Comp -3	Comp -4	Comp -5	Comp -6	Comp -7	Comp -8	Comp -9	Comp -10	Comp -11

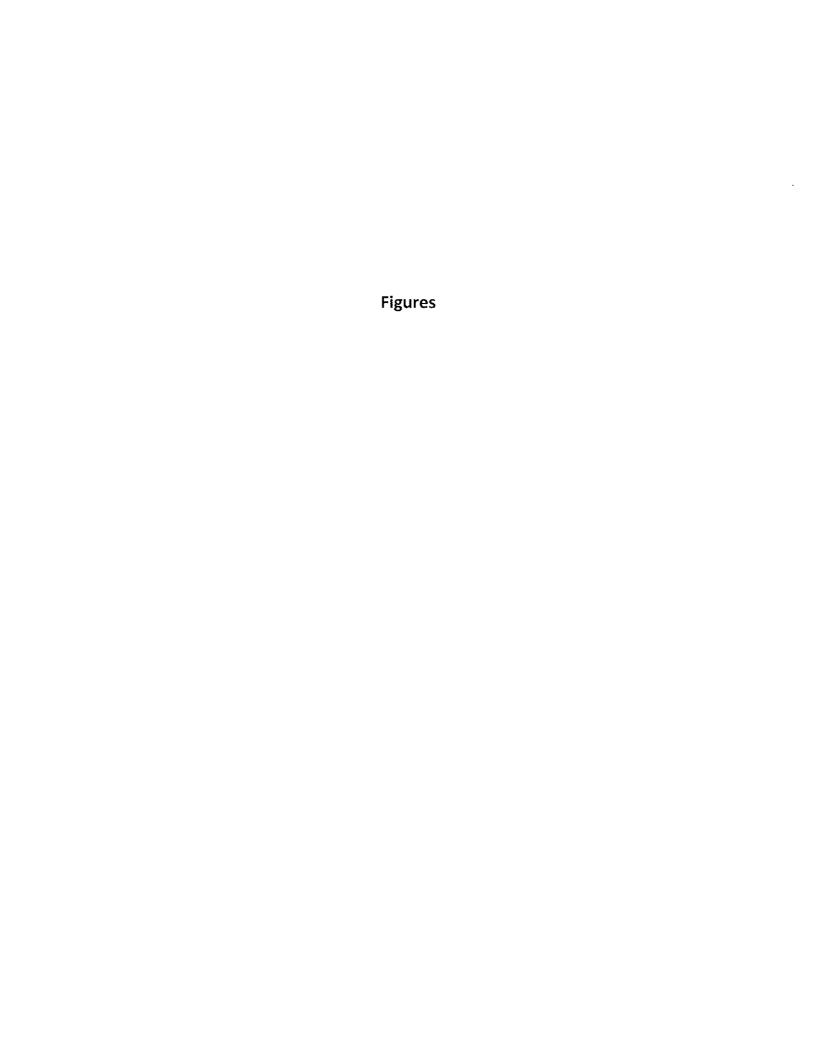
Notes: Analysis performed by Trace Analysis, Inc., Midland and Lubbock by EPA SW-846 Method 8021B (BTEX), Method 8015M (TPH) and 300.0 (chloride)

Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm) --: Sample not analyzed

RRAL: Recommended Remediation Action Level (RRAL) calculated from OCD guidance document (August 13, 1993)

<sup>\*:</sup> Will be determined following boring for depth to groundwater \*\*: OCD delineation level



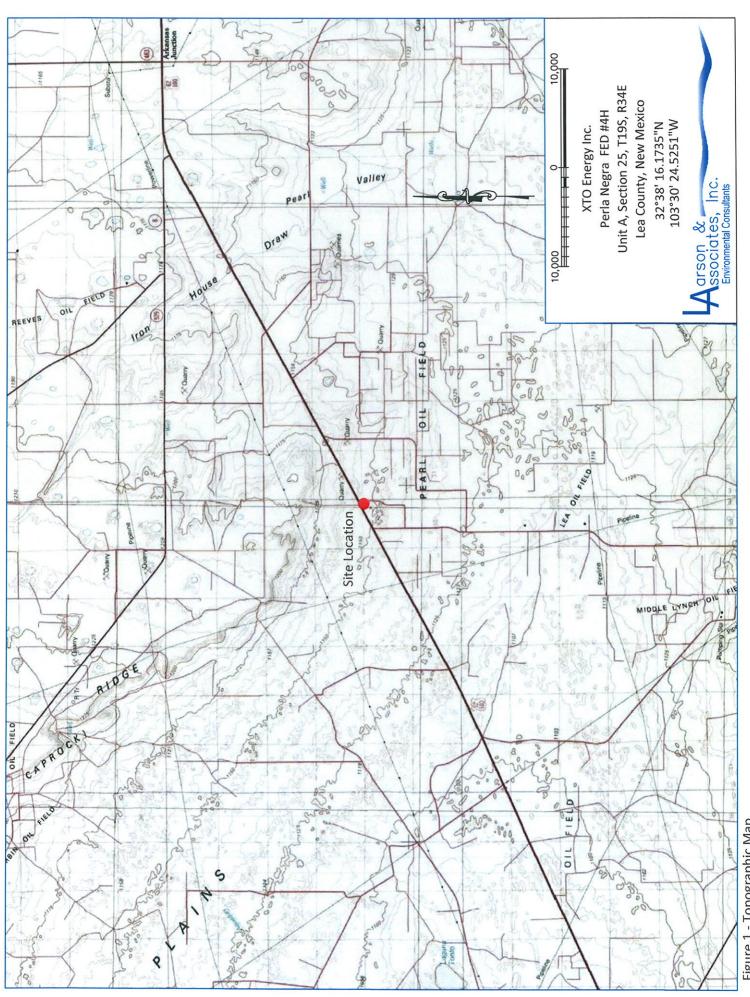


Figure 1 - Topographic Map

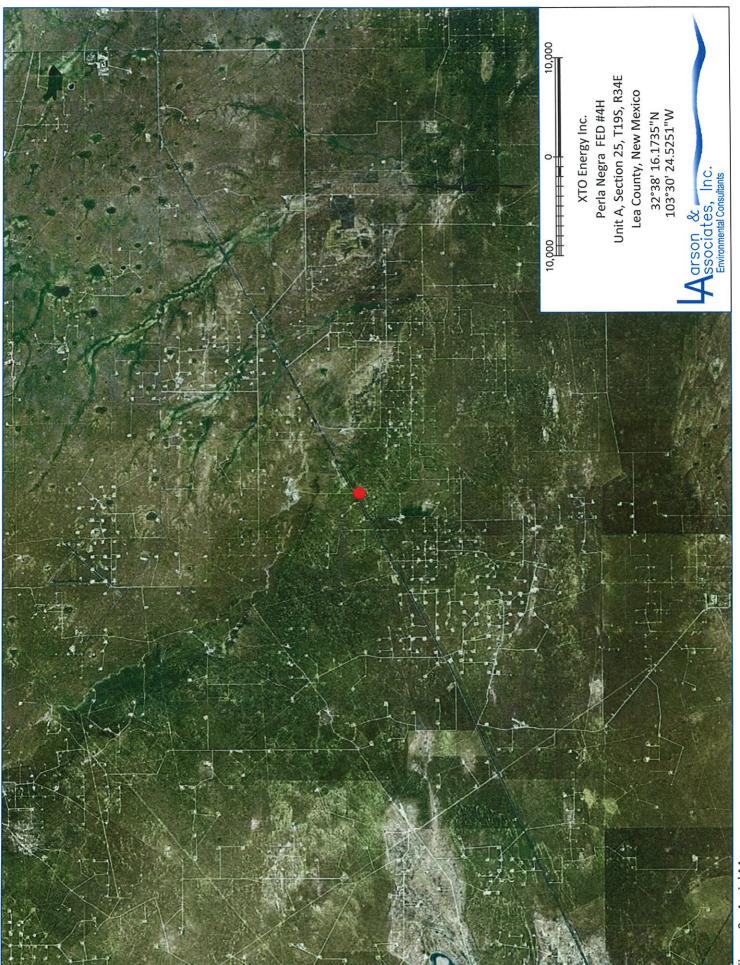


Figure 2 - Aerial Map

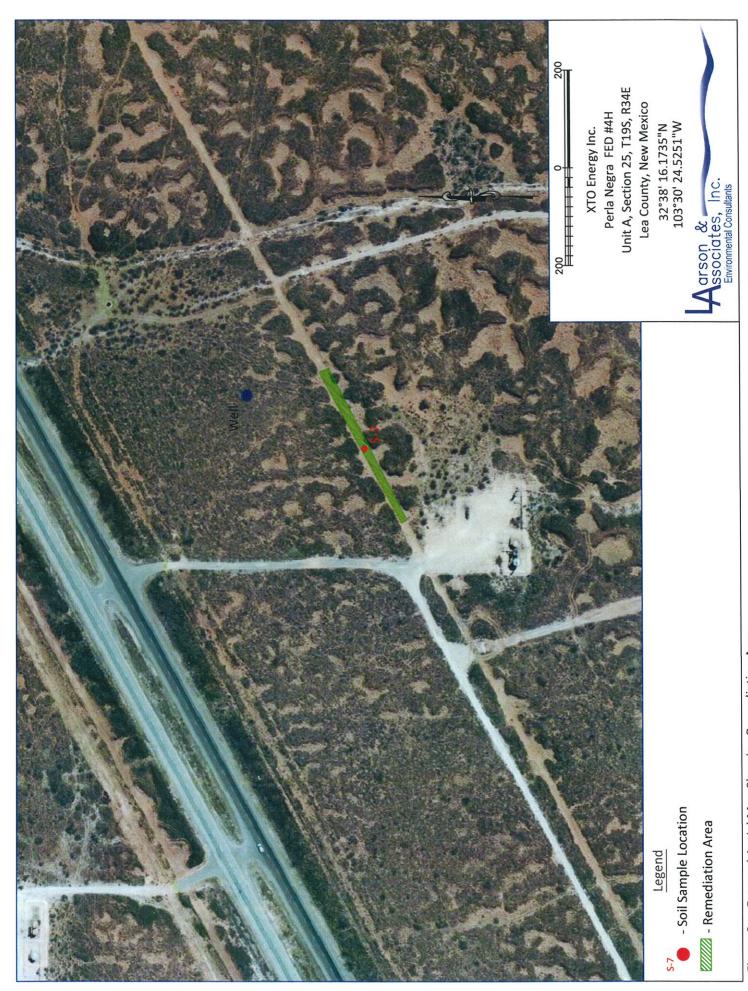


Figure 2a - Focused Aerial Map Showing Remediation Area

Figure 3 - Site Map Showing Soil Sample Locations

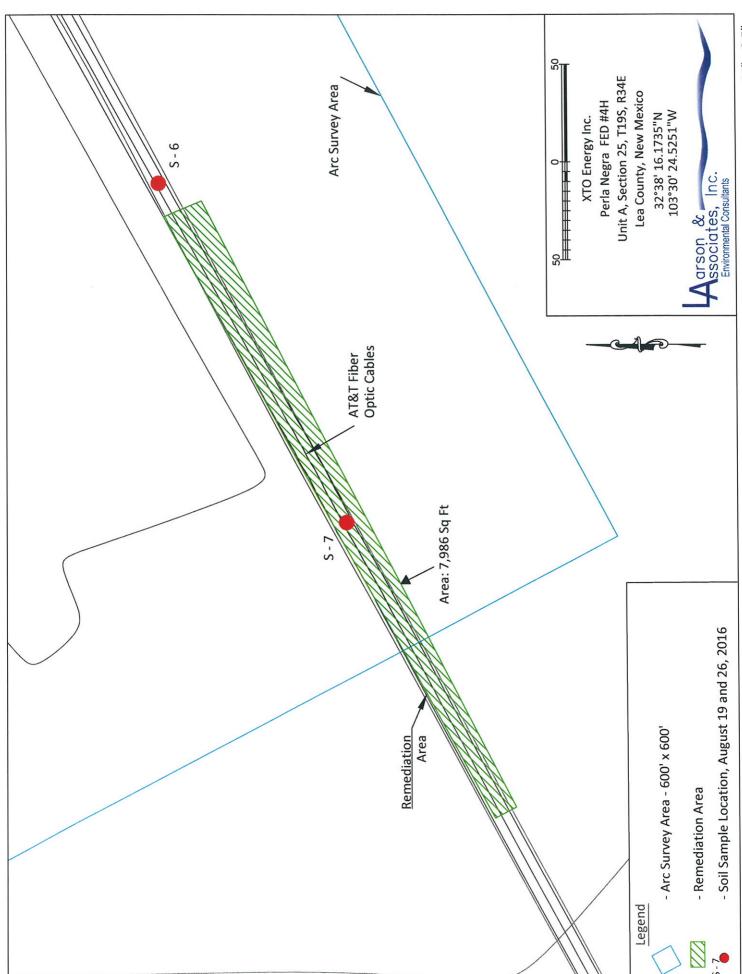


Figure 4 - Site Map Showing Remediation Area

## Appendix A Remediation Plan Approval

#### Mark Larson

From: Tucker, Shelly [stucker@blm.gov] Tuesday, July 19, 2016 3:03 PM Keyes, Jamie, EMNRD Sent:

To:

Mark Larson; McMinn, Dudley; Williams, Luke
Re: 1RP-4049, Perla Negra Fed Com #4H Remediation Plan for Right-of-Way, July 13, 2016 Subject:

BLM accepts/approves your remediation proposal.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Shelly 9 Tucker

Environmental Protection Specialist Bureau of Land Management

620 E. Greene St Carlsbad, NM 88220

575.234.5905 - Direct 575.361.0084 - Cellular

#### stucker@blm.gov



The BLM acceptance/approval does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment or if the location fails to reclaim properly. In such an event that the location does not revegetate, or future issues with contaminants are encountered, the operator will be asked to address the issues until the contaminant issues are fully mitigated and the location is successfully reclaimed. In addition, BLM approval does not relieve the operator of responsibility for compliance with any other federal, state or local laws/regulations.

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On Mon, Jul 18, 2016 at 9:05 AM, Keyes, Jamie, EMNRD < Jamie. Keyes@state.nm.us > wrote:

Good morning,

The remediation proposal is approved.

Thank you,

Jamie

From: Mark Larson [mailto: Mark@laenvironmental.com]

Sent: Friday, July 15, 2016 3:43 PM To: Keyes, Jamie, EMNRD; Tucker, Shelly Cc: McMinn, Dudley; Williams, Luke

Subject: Re: 1RP-4049, Perla Negra Fed Com #4H Remediation Plan for Right-of-Way, July 13, 2016

Jamie,

On behalf of XTO Energy, Inc. and per our meeting on July 8, 2016, please accept the attached remediation plan to address residual hydrocarbons in the right-of-way (ROW) located south of the Perla Negra Fed Com Well #4H in Lea County, New Mexico. Your approval of the remediation plan is requested. Please contact Dudley McMinn with XTO at (432) 682-8873 or me if you have questions.

Respectfully,

Mark J. Larson, P.G.

President/Sr. Project Manager

507 N. Marienfeld St., Suite 205

Midland, Texas 79701

(432) 687-0901 (O)

(432) 556-8656 ( C )



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## Appendix B Laboratory Reports



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100 Lubbock, Texas 79424 El Paso, Texas 79922 Midland, Texas 79703 Carrolton, Texas 75006 800-378-1296 8

806-794-1296 FAX 806 915-585-3443 FAX 915 432-689-6301 FAX 432

FAX 915 • 585 • 4944 FAX 432 • 689 • 6313

Suite 100 Carroliton, Texas 75006 972-242-7750 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

#### Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

#### Analytical and Quality Control Report

Travis Williams Larson and Associates, Inc.

P. O. Box 50685 Midland, TX, 79710

Project Name: XTO Perla Negra Project Number: 15-0167-01 . "

Report Date: August 24, 2016

Work Order: 16082203

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
426912	S-7	soil	2016-08-19	11:45	2016-08-22

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 15 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director James Taylor, Assistant Director Johnny Grindstaff, Operations Manager

#### Report Contents

Analytical Report       5         Sample 426912 (S-7)       5         Method Blanks       7         QC Batch 132286 - Method Blank (1)       7         QC Batch 132287 - Method Blank (1)       7         QC Batch 132296 - Method Blank (1)       7         Laboratory Control Spikes       9         QC Batch 132286 - LCS (1)       9         QC Batch 132287 - LCS (1)       9         QC Batch 132296 - LCS (1)       9         Matrix Spikes       11         QC Batch 132286 - xMS (1)       11         QC Batch 132287 - xMS (1)       11         QC Batch 132286 - CW (1)       11         QC Batch 132286 - CV (2)       13         QC Batch 132286 - CV (2)       13         QC Batch 132296 - CV (1)       13         QC Batch 132296 - CV (2)       13         QC Batch 132296 - CV	Case Narrative
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Matrix Spikes       11         QC Batch 132286 - xMS (1)       11         QC Batch 132297 - xMS (1)       11         QC Batch 132296 - MS (1)       11         Calibration Standards       13         QC Batch 132286 - CCV (1)       13         QC Batch 132286 - CCV (2)       13         QC Batch 132296 - CCV (1)       13         QC Batch 132296 - CCV (2)       13         Appendix       14	QC Batch 132287 - LCS (1)
QC Batch 132286 - xMS (1)	QC Batch 132296 - LCS (1)
QC Batch 132286 - xMS (1)       11         QC Batch 132287 - xMS (1)       11         QC Batch 132296 - MS (1)       11         Calibration Standards       13         QC Batch 132286 - CCV (1)       13         QC Batch 132286 - CCV (2)       13         QC Batch 132296 - CCV (1)       13         QC Batch 132296 - CCV (2)       13         Appendix       14	Matrix Spikes 1
QC Batch 132287 - xMS (1)	
QC Batch 132296 - MS (1)       11         Calibration Standards       13         QC Batch 132286 - CCV (1)       13         QC Batch 132286 - CCV (2)       13         QC Batch 132296 - CCV (1)       13         QC Batch 132296 - CCV (2)       13         Appendix       14	
QC Batch 132286 - CCV (1)	
QC Batch 132286 - CCV (1)	Calibration Standards 1
QC Batch 132286 - CCV (2)	
QC Batch 132296 - CCV (1)	
QC Batch 132296 - CCV (2)	
Appoint	QC Batch 132296 - CCV (2)
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#### Case Narrative

Samples for project XTO Perla Negra were received by TraceAnalysis, Inc. on 2016-08-22 and assigned to work order 16082203. Samples for work order 16082203 were received intact at a temperature of 15.2 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	$\operatorname{Prep}$	QC	Analysis
Test	Method	Batch	Date	Batch	Date
TPH DRO	S 8015 D	112115	2016-08-23 at 13:00	132286	2016-08-24 at 08:16
TPH GRO	S 8015 D	112128	2016-08-23 at 14:00	132296	2016-08-23 at 14:00
TPH ORO	S 8015 D	112115	2016-08-23 at 13:00	132287	2016-08-24 at 08:17

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16082203 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Page Number: 5 of 15 Report Date: August 24, 2016 Work Order: 16082203

15-0167-01 XTO Perla Negra

#### **Analytical Report**

Sample: 426912 - S-7

Laboratory: Lubbock

TPH DRO Analytical Method: S 8015 D Analysis: QC Batch: 132286 Date Analyzed: 2016-08-24 Prep Batch: 112115 Sample Preparation: 2016-08-23

RLDilution RLParameter Cert Result Units Flag 50.0  $\overline{\text{DRO}}$ 3630 mg/Kg 1,2,3

Recovery Spike Percent Limits Surrogate Flag Cert Result Units Dilution Amount Recovery 58.2 - 150 n-Tricosane 260 mg/Kg 25.0 1040 Qsr  $\mathbf{Q}_{\mathbf{N}\mathbf{r}}$ 

Sample: 426912 - S-7

Laboratory: Lubbock

Prep Method: S 5035 TPH GRO Analytical Method: S 8015 D Analysis: Analyzed By: MT QC Batch: 132296 2016-08-23 Date Analyzed: Prepared By: MT 2016-08-23 Prep Batch: 112128 Sample Preparation:

RLResult Units Dilution RLParameter Flag Cert 4.00 GRO 5 1,2,3 146mg/Kg

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.87	mg/Kg	5	2.00	94	76.4 - 123
4-Bromofluorobenzene (4-BFB) Qsr	Qsr		5.83	mg/Kg	5	2.00	292	69.4 - 120

Sample: 426912 - S-7

Laboratory: Lubbock

Analytical Method: Prep Method: N/A Analysis: TPH ORO S 8015 D QC Batch: 2016-08-24 Analyzed By: HJ132287 Date Analyzed: Prepared By: HJPrep Batch: 112115Sample Preparation: 2016-08-23

continued ...

Prep Method: N/A

ΗJ

HJ

Analyzed By:

Prepared By:

Report Date: August 24, 2016 Work Order: 16082203 Page Number: 6 of 15 15-0167-01 XTO Perla Negra

sample 426912 continued ...

Parameter	Flag	Cert	MDL Result	MQL Result	PQL Result		Units	Dilution	MDL	MQL	PQL	RL
			MDL	MQL	PQL	RL						
Parameter	Flag	Cert	Result	Result	Result	Result	Units	Dilution	MDL	MQL	PQL	RL
ORO			597	597	597	597	mg/Kg	1	7.48	50.0	50.0	50.0
								Spike		Percent	Rec	covery
Surrogate		Flag	Cert	Res	sult	Units	Dilution	Amour	nt	Recovery	$\Gamma$	imits
n-Tricosane	Qsr	Qsr			261	mg/Kg	1	25.0		1044	70	- 130
n-Triacontane	Oar	Osr				mø/Kø	1	25.0		764	70	~ 130

Work Order: 16082203 Page Number: 7 of 15 Report Date: August 24, 2016

XTO Perla Negra

15-0167-01

#### Method Blanks

Method Blank (1)

QC Batch: 132286

QC Batch: 132286

2016-08-24 Date Analyzed:

Analyzed By: HJ

Prep Batch: 112115

QC Preparation: 2016-08-23

Prepared By: HJ

					N	1DL		
Parameter		Fl	ag	Cert	Re	esult	Units	RL
DRO				1,2,3	<	8.47	mg/Kg	50
		_				Spike	Percent	Recovery
Surrogate	$\mathbf{Flag}$	$\operatorname{Cert}$	Result	$\operatorname{Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane			21.9	mg/Kg	1	25.0	88	58.2 - 150

Method Blank (1) QC Batch: 132287

QC Batch: 132287 Prep Batch: 112115 Date Analyzed: 2016-08-24 QC Preparation: 2016-08-23

Analyzed By: HJ Prepared By:

MDLRLParameter Flag Cert Result Units ORO <7.48 mg/Kg 50

Surrogate	Flag	Cert	Result	Units	Dilution	$egin{array}{c}  ext{Spike} \  ext{Amount} \end{array}$	Percent Recovery	Recovery Limits
n-Tricosane			21.9	mg/Kg	1	25.0	88	70 - 130
n-Triacontane			18.5	mg/Kg	1	25.0	74	70 - 130

Method Blank (1) QC Batch: 132296

2016-08-23 QC Batch: 132296 Date Analyzed: Prep Batch: 112128

Analyzed By: MT QC Preparation: 2016-08-23 Prepared By: MT

			MDL		
Parameter	Flag	Cert	Result	Units	RL
GRO		1.2.3	< 0.271	mg/Kg	4

Report Date: August 24, 2016

15-0167-01

Work Order: 16082203 XTO Perla Negra Page Number: 8 of 15

Spike Percent Recovery Surrogate Flag  $\operatorname{Cert}$ Units Dilution Amount Recovery Limits Result Triffuorotoluene (TFT) 76.4 - 123 2.00 110 2.21 mg/Kg 69.4 - 120 4-Bromofluorobenzene (4-BFB) 2.02  $\mathrm{mg}/\mathrm{Kg}$ 2.00 101

Work Order: 16082203 Page Number: 9 of 15 Report Date: August 24, 2016

15-0167-01 XTO Perla Negra

#### Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

QC Batch: 132286 Date Analyzed:

Analyzed By: HJ 2016-08-24 Prepared By: HJ Prep Batch: 112115 QC Preparation: 2016-08-23

			LCS			$_{ m Spike}$	Matrix		Rec.
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1.2,3	516	mg/Kg	1	500	< 8.47	103	68.5 - 136

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1.2.3	503	mg/Kg	1	500	< 8.47	101	68.5 - 136	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	$\operatorname{Rec}$ .	Rec.	Limit
n-Tricosane	25.0	24.2	mg/Kg	1	25.0	100	97	58.2 - 150

#### Laboratory Control Spike (LCS-1)

Analyzed By: HJ QC Batch: Date Analyzed: 2016-08-24 132287 Prepared By: HJ Prep Batch: 112115 QC Preparation: 2016-08-23

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	29.4	32.5	mg/Kg	1	25.0	118	130	70 - 130
n-Triacontane	17.6	18.6	mg/Kg	1	25.0	70	74	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: Date Analyzed: 2016-08-23 Analyzed By: MT 132296 Prep Batch: 112128 QC Preparation: 2016-08-23 Prepared By: MT Report Date: August 24, 2016

15-0167-01

Work Order: 16082203 XTO Perla Negra Page Number: 10 of 15

			LCS			Spike	Matrix		Rec.
Param	$\mathbf{F}$	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1,2,3	15.2	mg/Kg	1	20.0	< 0.271	76	64.2 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			$_{ m Spike}$	Matrix		${ m Rec.}$		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO		1,2,3	15.0	mg/Kg	1	20.0	< 0.271	75	64.2 - 120	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	$\operatorname{Rec}$ .
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.15	2.00	mg/Kg	1	2.00	108	100	76.4 - 123
4-Bromofluorobenzene (4-BFB)	2.22	2.22	mg/Kg	1	2.00	111	111	69.4 - 120

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XTO Perla Negra

15-0167-01

#### Matrix Spikes

Matrix Spike (xMS-1) Spiked Sample:

QC Batch: 132286 Date Analyzed:

2016-08-24

Analyzed By: HJ

Prep Batch: 112115

QC Preparation: 2016-08-23

Prepared By: HJ

			MS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1,2,3	502	mg/Kg	1	500	28.7	95	49.3 - 138

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			MSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1,2,3	484	mg/Kg	1	500	28.7	91	49.3 - 138	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	59.0	56.9	mg/Kg	1	50	118	114	58.2 - 150

Matrix Spike (xMS-1) Spiked Sample: 426940

QC Batch: 132287 Prep Batch: 112115 Date Analyzed: 2016-08-24 QC Preparation: 2016-08-23 Analyzed By: HJ Prepared By: HJ

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	${ m Rec.} \ { m Limit}$
n-Tricosane	55.4	53.2	mg/Kg	1	50	111	106	70 - 130
n-Triacontane	44.2	43.7	mg/Kg	1	50	88	87	70 - 130

Matrix Spike (MS-1) Spiked Sample: 426912

QC Batch: 132296 Analyzed By: MT Date Analyzed: 2016-08-23 Prep Batch: 112128 QC Preparation: 2016-08-23 Prepared By: MT

Report Date: August 24, 2016 15-0167-01

Work Order: 16082203 XTO Perla Negra

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Param		F	С	MS Result	Units	Dil.	Spike Amount		atrix esult F	lec.		Rec. .imit
GRO	Qs	Q×	1,2.3	136	mg/Kg	ş 5	20.0		146 -	50	35.	3 - 129
Percent recovery is base	d on the spike	resul	lt. RPD	is based o	$\mathbf{n}$ the $\mathbf{s}_{\mathbf{i}}$	pike and sp	oike duplic	cate res	suit.			
Percent recovery is base	d on the spike	e resul	lt. RPD MSD	is based o	n the sp	pike and sp Spike	oike duplic Matrix	cate res	sult. Rec.			RPD
Percent recovery is base Param	d on the spike F	e resul C		is based o Units	n the sp Dil.		-	cate res Rec.			RPD	RPD Limit

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.98	1.89	mg/Kg	5	2	99	94	76.4 - 123
4-Bromofluorobenzene (4-BFB) Qsr Qsr	4.94	5.72	mg/Kg	5	2	247	286	69.4 - 120

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15-0167-01 XTO Perla Negra

#### Calibration Standards

#### Standard (CCV-1)

QC Batch: 132286 Date Analyzed: 2016-08-24 Analyzed By: HJ

<b>D</b>	D)	<b>a</b> .	TT **	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1.2.3	mg/Kg	500	528	106	80 - 120	2016-08-24

#### Standard (CCV-2)

QC Batch: 132286 Date Analyzed: 2016-08-24 Analyzed By: HJ

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
	1 148	COLU	Ollius			recovery	Diffies	
DRO		1.2.3	$_{ m mg/Kg}$	500	561	112	80 - 120	2016-08-24

#### Standard (CCV-1)

QC Batch: 132296 Date Analyzed: 2016-08-23 Analyzed By: MT

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1,2,3	mg/Kg	1.00	0.956	96	80 - 120	2016-08-23

#### Standard (CCV-2)

QC Batch: 132296 Date Analyzed: 2016-08-23 Analyzed By: MT

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1.2.3	mg/Kg	1.00	0.799	80	80 - 120	2016-08-23

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#### **Appendix**

#### Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

#### **Laboratory Certifications**

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	NELAP	T104704219-16-12	Lubbock
4		2015-066	Lubbock

#### Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

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#### Attachments

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

1, 16087203

CHAIN-OF-CUSTODY

Willams CUSTODY SEALS - 

BROKEN 

INTACT 

NOT USED FIELD NOTES THERM #: TO-CHOCK COLLECTOR: Travis PAGE Perla Negra LAB WORK ORDER #: RECEIVING TEMP!5.2 LABORATORY USE ONLY: A HAND DELIVERED CI CARRIER BILL # PROJECT LOCATION OR NAME: XTO LAI PROJECT #: 15-0147-01 72/16 NOT Signature)
RECEIVED BY: (Signature)
RECEIVED BY: (Signature) 2 DAY OTHER [] DATE: PO #: いナー・て 507 N. Marienfeld, Ste. 200 Midland, TX 79701 **PRESERVATION UNPRESERVED** RECEIVED BY: (Signature) 432-687-0901 ICE □ HOBN □ DSSH HNO3 Monda HCI # of Containers Matrix DATE/TIME

DATE/TIME SAZZINE SAZZINE 3H:11 SL=SLUDGE OT=OTHER Time P=PAINT 8-19-16 Date A arson & ssociates, Inc. Environmental Consultants W=WATER A=AIR Lab# RELINQUISHED BY:(Signature) RELINQUISHED BY: (Signatu RELINQUISHED BY: (Signal Data Reported to: ☐ Yes TIME ZONE: Time zone/State: TRRP report? Sample I.D. Field SS 5-7 TOTAL

4



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100 Eubbock. Texas 79424 El Paso, Texas 79922 Midland. Texas 79703 Carroliton. Texas 75006 806+794+1296 915+585+3443 432+689+6301

800+378+1296

FAX 806+794+1298 FAX 915+585+4944 FAX 432+689+6313

Report Date: August 31, 2016

16082904

Work Order:

972-242-7750

E-Mail: lab@traceanalysis.com WEB. www.traceanalysis.com

#### Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

# Analytical and Quality Control Report

Mark Larson Larson and Associates, Inc.

P. O. Box 50685 Midland, TX, 79710

Project Name: XTO Perla Negra Project Number: 15-0167-01

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
427260	S-7	soil	2016-08-26	13:10	2016-08-29

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 11 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director James Taylor, Assistant Director Johnny Grindstaff, Operations Manager

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## Case Narrative

Samples for project XTO Perla Negra were received by TraceAnalysis, Inc. on 2016-08-29 and assigned to work order 16082904. Samples for work order 16082904 were received intact at a temperature of 3.4 C.

Samples were analyzed for the following tests using their respective methods.

		$\operatorname{Prep}$	$P_{rep}$	QC	Analysis
Test	Method	Batch	Date	Batch	Date
TPH DRO	S 8015 D	112268	2016-08-30 at 13:00	132460	2016-08-30 at 15:11
TPH GRO	S 8015 D	112278	2016-08-30 at 14:39	132471	2016-08-30 at 14:39

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16082904 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: August 31, 2016 Work Order: 16082904 Page Number: 5 of 11

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# **Analytical Report**

Sample: 427260 - S-7

Laboratory: Lubbock

Analysis: TPH DRO QC Batch: 132460 Prep Batch: 112268

Qsr

Qsr

Analytical Method: S 8015 D
Date Analyzed: 2016-08-30
Sample Preparation: 2016-08-30

Prep Method: N/A Analyzed By: HJ Prepared By: HJ

58.2 ~ 150

RLParameter Flag Dilution Cert Result Units RLDRO 2920 mg/Kg 50.0 1.2.3 Spike Percent Recovery Surrogate Flag Cert Units Dilution Recovery Limits Result Amount

mg/Kg

179

Sample: 427260 - S-7

Laboratory: Lubbock

n-Tricosane

Analysis: TPH GRO QC Batch: 132471 Prep Batch: 112278 Analytical Method: S 8015 D
Date Analyzed: 2016-08-30
Sample Preparation: 2016-08-30

Prep Method: S 5035
Analyzed By: MT
Prepared By: MT

716

25.0

 Parameter
 Flag
 Cert
 Result
 Units
 Dilution
 RL

 GRO
 Je.Qc
 1.2.3
 1170
 mg/Kg
 5
 4.00

							Spike	Percent	Recovery
Surrogate		Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	Qsr	Qsr		1.23	mg/Kg	5	2.00	62	76.4 - 123
4-Bromoftuorobenzene (4-BFB)	Qsr	Qsr		40.1	mg/Kg	5	2.00	2005	69.4 - 120

Report Date: August 31, 2016 Work Order: 16082904 Page Number: 6 of 11

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Flag

# Method Blanks

Method Blank (1)

QC Batch: 132460

QC Batch: 132460 Prep Batch: 112268

Parameter

Date Analyzed: 2016-08-30 Analyzed By: HJ Prepared By: HJ

QC Preparation: 2016-08-30

> MDL Result Units RL< 8.47 mg/Kg

			·-O	00.0				
DRO				1.2.3	<	8.47	mg/Kg	50
	wa.	~			Mar I	Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	$\operatorname{Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane			22.1	mg/Kg	1	25.0	88	58.2 - 150

Cert

Method Blank (1) QC Batch: 132471

QC Batch: 132471 Date Analyzed: Prep Batch: 112278

2016-08-30 QC Preparation: 2016-08-30 Analyzed By: MT Prepared By:

MDL Parameter Units RLFlag Cert Result GRO < 0.271 mg/Kg 4 1.2.3

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	76.4 - 123
4-Bromofluorobenzene (4-BFB)			1.94	mg/Kg	1	2.00	97	69.4 - 120

Report Date: August 31, 2016 Work Order: 16082904 Page Number: 7 of 11

15-0167-01 XTO Perla Negra

# Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

QC Batch: 132460 Date Analyzed: 2016-08-30 Analyzed By: HJ Prep Batch: 112268 QC Preparation: 2016-08-30 Prepared By: HJ

Rec. LCS Spike Matrix Param Limit Result Units Dil. Amount Result Rec. DRO 500 < 8.47 80 68.5 - 136 401 mg/Kg

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\Gamma$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1.2.3	399	mg/Kg	1	500	< 8.47	80	68.5 - 136	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	27.6	27.6	mg/Kg	1	25.0	110	110	58.2 - 150

#### Laboratory Control Spike (LCS-1)

 QC Batch:
 132471
 Date Analyzed:
 2016-08-30
 Analyzed By:
 MT

 Prep Batch:
 112278
 QC Preparation:
 2016-08-30
 Prepared By:
 MT

			LCS			Spike	Matrix		$\operatorname{Rec}$ .
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1.2.3	21.2	mg/Kg	1	20.0	< 0.271	106	64.2 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO		1.2.3	20.7	mg/Kg	1	20.0	< 0.271	104	64.2 - 120	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.96	1.83	mg/Kg	1	2.00	98	92	76.4 - 123
4-Bromofluorobenzene (4-BFB)	2.06	2.09	mg/Kg	1	2.00	103	104	69.4 - 120

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XTO Perla Negra

# Matrix Spikes

15-0167-01

Matrix Spike (xMS-1) Spiked Sample: 427390

QC Batch: 132460 Date Analyzed: 2016-08-30 Analyzed By: HJ
Prep Batch: 112268 QC Preparation: 2016-08-30 Prepared By: HJ

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1,2,3	369	mg/Kg	1	500	< 8.47	74	49.3 - 138

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			MSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1,2,3	378	mg/Kg	1	500	< 8.47	76	49.3 - 138	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	30.9	30.3	mg/Kg	1	25	124	121	58.2 - 150

Matrix Spike (MS-1) Spiked Sample: 427260

QC Batch: 132471 Date Analyzed: 2016-08-30 Analyzed By: MT
Prep Batch: 112278 QC Preparation: 2016-08-30 Prepared By: MT

				MS			$_{ m Spike}$	Matrix		Rec.
Param		F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	Qs	Qs	1,2,3	1280	mg/Kg	5	20.0	1170	550	35.3 - 129

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

				MSD			Spike	Matrix		Rec.		RPD
Param		$\mathbf{F}$	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
GRO	Qs	Qs	1.2.3	1380	mg/Kg	5	20.0	1170	1050	35.3 - 129	8	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	$_{ m MS}$	MSD			Spike	$_{ m MS}$	MSD	$\operatorname{Rec}$ .
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.70	1.44	mg/Kg	5	2	85	72	76.4 - 123
4-Bromofluorobenzene (4-BFB) — Qsr — Qsr	43.7	44.9	${ m mg/Kg}$	5	2	2185	2245	69.4 - 120

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## Calibration Standards

Standard (CCV-1)

QC Batch: 132460 Date Analyzed: 2016-08-30 Analyzed By: HJ

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1,2,3	mg/Kg	500	406	81	80 - 120	2016-08-30

Standard (CCV-2)

QC Batch: 132460 Date Analyzed: 2016-08-30 Analyzed By: HJ

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
DBO		1 0 0	mø/Kø	500	407	<b>Я</b> 1	80 - 120	2016-08-30

Standard (CCV-1)

QC Batch: 132471 Date Analyzed: 2016-08-30 Analyzed By: MT

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1.2.3	mg/Kg	1.00	0.890	89	80 - 120	2016-08-30

Standard (CCV-2)

QC Batch: 132471 Date Analyzed: 2016-08-30 Analyzed By: MT

					$\rm CCVs$	CCVs	$\rm CCVs$	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO	l Qc	Qe	1,2,3	mg/Kg	1.00	1.33	133	80 - 120	2016-08-30

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# **Appendix**

## Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

#### **Laboratory Certifications**

	Certifying	Certification	Laboratory
$\mathbf{C}$	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	L-A-B	L2418	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	NELAP	T104704219-16-12	Lubbock
4	NELAP	T104704392-14-8	Midland
5		2015-066	Lubbock

## Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- MI1 Split peak or shoulder peak
- MI2 Instrument software did not integrate
- MI3 Instrument software misidentified the peak
- MI4 Instrument software integrated improperly
- MI5 Baseline correction
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.

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F Description

U The analyte is not detected above the SDL

#### Result Comments

1 CCV high, outside control limits due to carryover from sample.

## Attachments

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

>		1 81				ПТ	T	$\top$	$\top$	$\top$	TT						
CHAIN-OF-CUSTODY	AB WO	COLLECTOR		00 N 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 00 00 00 00 00 00 00 00 00 00 00 00 0								LABORATORY USE ONLY:	CUSTODY SEALS - G BROKEN GAINTACT G NOT USED	☐ CARRIER BILL#	MHAND DELIVERED	
	DATE: $8 - 26 - 16$ PO #:  PROJECT LOCATION OR NAME:	2	STOCKED OF CONTROL OF THE STOCKED OF	(210 Co)	\$ (3) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4								TURN AROUND TIME	1 DAY CK	OTHER []		
		LAI PF		SIS	No so lest to so lest	^ /							8/29/11- 10:00		118	Ahm	134
	507 N. Marienfeld, Ste. 200 Midland, TX 79701 432-687-0901	PRESERVATION	SEKAED J N°SOH □	NAPRES ICE H <sub>2</sub> SO <sub>4</sub> ⊂ HNO <sub>3</sub>	<u> </u>						-	RECEIVED BY: (Signature)	RECEIVED BY: (Signature)	RECEIVED BY: (Signature)	4 126176		
	507		JGE ER	zainers.	Time Matrix #	1:10 5 1:1							DAIE/IIME REC	BATE/TIME REC 8/29/12 (5:30)	DATE/TIME REC	0	
+	, Inc.		S=SOIL P=PAINT W=WATER SL=SLUDGE A=AIR OT=OTHER			1 71-72-8 072124							de	)		Analysis	
16082904	SSOCIATES, Inc.	Data Reported to:	TRRP report W=	TIME ZONE: Time zone/State:	I.D.	2-1(1-5)42						TOTAL	RELINQUISHED RY:(Signature)	REUNOUISHED BY: (Signature)	RELINQUISMED BY:(Signature)	Trace	

Appendix C

Photographs



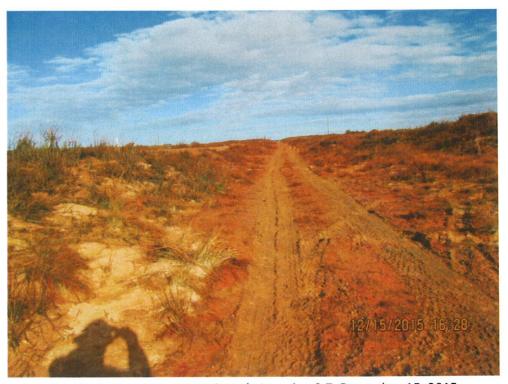
Well Sign



Viewing East on ROW from Southwest Corner of Location December 5, 2015



Viewing Southwest on ROW December 5, 2015



Viewing East on ROW near Sample Location S-7, December 15, 2015



Viewing East on ROW near Sample Location S-7, March 9, 2016



Viewing West on ROW near Sample Location S-7, June 2, 2016



Viewing West on ROW, August 18, 2016



Viewing West on ROW, August 26, 2016



Viewing West on ROW, August 29, 2016



Viewing West on ROW, August 29, 2016



Viewing Southeast on ROW, August 31, 2016



Viewing West on ROW, August 31, 2016



Viewing West on ROW, August 31, 2016

# Appendix D Initial and Final C-141

District 1
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., 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

Form C-141
Revised August 8, 2011
Submit 1 Copy to appropriate District Office in

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

			Rele	ease Notific	eation	and Co	rrective A	ction					
						OPERATOR   Initial Report   Final						Final Report	
Name of Co			Contact: Stephanie Rabadue										
Address: 50 Facility Na			Telephone No.: 432-620-6714 Facility Type: Well Site										
Surface Ow	Surface Owner: Bureau of Land Management   Mineral Owner: Bureau of Land Management   API No.: 30-025-42577												
TY '. Y	LOCATION OF RELEASE												
Unit Letter A	Section 25	Township 19S	Range 34E	Feet from the 298		South Line orth	Feet from the 485		Vest Line East	County Lea	County Lea		
Latitude: 32.637653 N Longitude: 103.506267 W  NATURE OF RELEASE													
Type of Rele	ase: Blow C	Out		NAI				Volume E	ecovered:				
	55/55/55/5		Volume of Release:  301.3bbls oil 192.8mcf gas  Volume Recovered: 158.63bbls (to Clean-Up in Pr						Up in Progress				
Source of Re			Date and Hour of Occurrence Date and				Hour of Discovery 5, 11AM CST						
Was Immedia	ate Notice C	equired	If YES, To Whom?										
By Whom? E		Date and Hour: 12/1/2015 2:30pm											
Was a Water	course Reac		If YES, Volume Impacting the Watercourse. Not Applicable										
If a Watercou Not Applicab	le. No wate	rcourse in vic	inity.			,							
Describe Cause of Problem and Remedial Action Taken.*  Pulling unit was fishing parted swab line and cups, they pulled out tubing until got to the tail of the swab line. Installed a TIW valve and latched on with rod elevator and pulled out hole. Tied onto the tubing to pump down and it was plugged. Took off the TIW and started out of the hole when well kicked. Wild well control came to location and well was secured by placing TIW valve on the well head.													
Describe Area Affected and Cleanup Action Taken.*  Estimated area affected to be 500'x500'.  XTO Energy, Inc has hired a third-party environmental company to evaluate and perform clean-up. Clean-up is in progress  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 al public health should their o	I operators a or the enviruperations ha ment. In a	are required to onment. The ave failed to a ddition, NMO	report an acceptanc dequately CD accep	is true and comp d/or file certain re e of a C-141 repo investigate and re tance of a C-141	elease no ort by the emediate	tifications ar NMOCD ma contamination	nd perform correct arked as "Final Ro on that pose a thre	tive acti eport" d eat to gr	ions for rele oes not reli ound water	eases which eve the oper surface wa	may or rator of iter, h	endanger of liability uman health	
Signature: Styphonie Rabadue						OIL CONSERVATION DIVISION							
Printed Name	: Stephanie	Rabadue	A	Approved by Environmental Specialist:									
Title: Regulat	ory Analyst				A	Approval Date: Expiration I			Date:				
E-mail Address: stephanie_rabadue@xtoenergy.com  Date: 12/21/2015 Phone: 432-620-6714						Conditions of Approval:			Attached				

<sup>\*</sup> Attach Additional Sheets If Necessary

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 October 10, 2003
Submit 2 Copies to appropriate
District Office in accordance

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

## Release Notification and Corrective Action

						OPERA:	☐ Initial Report ☑ Final Repor						
Name of Co	ompany: 3	(TO Energy, I	nc.			Contact: Du	lley McMinn			,			
Address: 500 W. Illinois St Ste 100, Midland, Texas 79701						Telephone No.: (432) 682-8873							
Facility Name: Perla Negra Federal Com #4H						Facility Type: Well Site							
Surface Ow	ner: Bure	au of Land M	anagemen	t Mineral C	wner E	Bureau of Lan	d Management		Lease N	lo.30-025-4	2577		
				LOCA	TIA	N OF REI	TRACTE						
Unit Letter	Section	Township	Range	Feet from the		South Line	Feet from the	Fast/V	Vest Line	County			
A	25	198	34E	298		North	485	East		Lea			
	<u>[</u>		<u> </u>										
			L	atitude: 32.637	653N	Longitud	le: -103.506267	7 <b>W</b>					
				NAT	'URE	OF RELI	EASE						
Type of Rele	ase: Blow	Out			·····	Volume of	Release: 301.3 bl		Volume R	lecovered:	158.63	bbl oil	
						17-4 31	192.8 m lour of Occurrenc	Data and	Uaur of Die	~~~~			
Source of Release: Well						1	our of Occurrenc	Date and Hour of Discovery: 12/01/2015, 11 AM CST					
Was Immedi	ate Notice (					If YES, To	Whom?					· F	
		X	Yes _	No 🗌 Not Re	quired	Jim Amos,	Bureau of Land I	Manage	ment				
		XTO Energy	, Inc.			Date and Hour 12/01/2015, 2:30 pm							
Was a Watercourse Reached?  ☐ Yes ☒ No						If YES, Volume Impacting the Watercourse.  Not applicable							
						rect applic							
		pacted, Descr ercourse in vic		•									
reor appacas	ic – no wait	Medulae in vie	anny										
elevator and kicked. Wild Describe Are location. Af	pulled out i Well Cont ea Affected fected area	of hole. Tied rol came to lo and Cleanup off location to	onto the cation and Action Ta	ps. They pulled of tubing to pump of well was secured aken.* Liquid p 6% solution of n	down at by place icked unicrobia	nd it was plug cing TIW valu p with vacuu al product and	gged. Took off the converse on well head.  In truck. Soil to tested for BTEX	about 8	and started inch deptl and chloride	d out of the	om afi	when the weeted area ow RRAL	
with Micro-L	3ac M-100F	I (microbe), C	SNF (nuti	ated in AT&T fib rient), tilled and w	vatered.	TPH reduce	d to 3,776 mg/Kg	(0 to 1					
				I, water and restor					rstand that	pursuant to	NMC	CD rules	
regulations a public health should their or the enviro	Il operators or the envo operations I onment. In	are required ironment. The nave failed to addition, NM	to report e acceptar adequately IOCD acc	and/or file certain ace of a C-141 re y investigate and eptance of a C-14	n releas port by remedia	the NMOCE to contamination	s and perform comarked as "Fination that pose a the	orrectivo il Repoi breat to	actions for t" does not ground wa	or releases v t relieve the ter, surface	which is operatively operation.	may endan tor of liabi human hea	
federal, state	, or local lav	vs and/or regu	lations.				OIL COM	OPDI	, A TOTON I	DIVICIO	```\ T		
Signature:						OIL CONSERVATION DIVISION							
/	ar I plea Wit	liame				Approved by	District Supervis	or:	am X lhyer				
Printed Name	c. Luke Wil	naillS					00/07/201	<u> </u>		111			
Title: EHS C	oordinator					Approval Da	e: 09/07/201	0	Expiration	Date: ///			
E-mail Address: Luke_Williams@xtoenergy.com						Conditions of Approval:				Attached			
Date: 09/01/2016 Phone: (432) 682-8873						///							
Date: 09.	/01/2016		Phone:	(432) 682-8873				///		1RP 404	9		