Federal 18 #1T Remediation System
2017 2nd Quarter Report

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Introduction

The purpose of this report is to summarize the current on-site activities involving venting gas and producing water from a former coal bed methane gas well at the Federal 18 #1T. The casing of this well has been modified to vent gas and purge water from the Ojo Alamo Formation. The setup and initial installation of this system is detailed in a report submitted to Brandon Powell, New Mexico Oil Conservation Division (OCD), in November 2010. This quarterly report details operations for the quarter.

History

The vacuum system at the Federal 18 #1T is being operated as part of an on going effort between the OCD and XTO Energy, Inc. (XTO) to vent gas from the Nacimiento formation just above the Ojo Alamo Formation. Gas was found in the Nacimiento formation, which could have come from several contributing sources. The Federal 1 #18 (30-045-09466), located in Section 10 of Township 30N, Range 13W and approximately 2,600' to the south-west of water well SJ-01737, was plugged in 1988 by Southern Union Oil Company. This well only had an initial surface casing of 200' when it was drilled in 1959. Section 18 also has one (1) additional well plugged by XTO Energy, Inc. in 2010. Section 19 of Township 30N, Range 12W has two (2) historically plugged wells. Approximately 4,400' to the south of water well SJ-01737, the Dansby #2 (30-045-09402) was plugged by Don Trader, Inc. in 1954 with a total depth of 1980' and a surface casing of only 100', and the second was a well plugged by Amoco Production in 1988. There are also three (3) additional wells plugged by Texacoma in 1997 in Section 19. There are additionally numerous oil and gas wells being operated by local exploration and production companies in the area. In Section 18, there are three (3) wells being operated by XTO Energy, Inc., and two (2) wells being operated by ConocoPhillips as Burlington Resources. In Section 19, there are nine (9) wells being operated by XTO Energy, Inc. In Section 7, there are seven (7) wells being operated by XTO Energy, Inc, and four (4) wells being operated by Robert L Bayless Producers, LLC. Furthermore, there is naturally occurring gas in the formation according to statements from local water well drillers, and a casing leak was discovered at the New Mexico Federal N #3E well site, (located in Unit D, Section 18, Township 30N, Range 12W, San Juan County, New Mexico). This leak was identified as a result of discovery of gas in a local water well (SJ 1737) in April 2010. Bradenhead pressures were observed at several XTO wells in the area. The New Mexico Federal N #3E, the New Mexico Federal N #3F and the New Mexico Federal N #3 all had bradenhead pressure tests performed. The bradenhead pressure from the New Mexico Federal N #3E was 17 psi, indicating a leak in the casing. The casing leak was repaired, and the New Mexico Federal N #3E was put back into operation. In agreement with the OCD, a nearby gas well scheduled to be plugged, Federal 18 #1T, was modified to act as a venting well by setting a plug at approximately 513 feet. Perforations were made in the casing at 437 feet and 457 feet in order to assess the groundwater and vent gas from the Nacimiento.

On September 24, 2010, a swab rig was used to determine if the well would produce water using the perforations. The swab rig recovered approximately 2 barrels of water, indicating that the

perforations would produce water. A sample collected during the swab returned results above Water Quality Control Commission (WQCC) standards for benzene, total xylenes, and total chlorides; see attached ***Federal 18 #1T Water Results Table***. Due to the low pH and high chlorides, it was inferred that the acid used to dissolve cement during perforation activities may have infiltrated the aquifer, causing the increased levels shown in the sampling results. XTO recommended pumping the aquifer until sampling results were below the WQCC standards for BTEX and chlorides.

A pump was installed in the Federal 18 #1T on November 9, 2010 at approximately 485 feet. During the pump installation, the water level was checked using a Keck ET Long water level indicator. The static water level was found to be approximately 402.20 feet. The pump was initially set to operate four (4) times a day for 15 minutes, purging approximately 260 gallons per day. During swab and pump installation activities, no gas was found flowing from the well.

On November 11, 2010, a small vacuum pump was installed at the Federal 18 #1T to determine if gas could be vented. The discharge from the vacuum was checked using a MSA 4-Gas Monitor, which confirmed that methane, was being vented from the vacuum pump discharge. The vacuum pump operates at a discharge rate of three (3) standard cubic feet per minute (scfm), which is equivalent to approximately six (6) actual cubic feet per minute (acfm) based on elevation. This volume was calculated using the conversion factors provided by the vacuum pump manufacturer, Becker. The vacuum pump initially held a vacuum of approximately -12 inches of mercury on the casing of the Federal 18 #1T during operation. A portable generator placed on-site powered both the vacuum pump and the water pump.

The water pump was plumbed into the existing water lines on site, so that all water would pump into the 210-barrel water tank left on-site from production activities. Water piping above ground was wrapped with heat trace and insulation to prevent freezing.

The system was electrified on February 3, 2011 to prevent down time due to generator maintenance issues.

Currently the Federal 18-1T system visually checked on a weekly basis. The site check includes verifying pump operation, vacuum operation, recording volume changes based on week prior, and verifying that no other site conditions need adjustment. The 1737 well is evaluated on a weekly basis to open the valve for a week and then closing the valve the following week, before the valve is opened the next week a record of the pressure is taken before opening the valve.

2nd Quarter Activities

During the 2nd quarter of 2017, the system ran continuously with no down time. As of June 30, 2017, approximately 20,516 cubic feet (MCF) of gas has been vented from the Federal 18 #1T casing, with the system venting approximately 60.4 MCF per week during operation, while maintaining an average casing pressure of -10 inches of mercury on the Federal 18 #1T casing.

A total of 927,854 gallons of water have been removed from the Federal 18 #1T as of June 16, 2017. The attached ***Federal 18 #1T Water Results Table*** shows that that benzene concentrations have had a rebound in the quarter with one (1) sampling event (June 16, 2017) returning results

above the WQCC standard at 64.6 ppb. Chloride levels have remained constant through the quarter, remaining steady at 14.2 ppm. pH values remained constant in the quarter, returning results of 7.05. TDS continues to be above WQCC standards at 2360 ppm, but background levels (1,400 ppm) in water well SJ 1737 are historically above WQCC standards as well.

The pressure at well SJ 1737 was checked over the course of the quarter. The pressure was checked by shutting in the casing for a minimum of one (1) week prior to reading the pressure gauge. The pressure readings are outlined in the attached ***Well SJ 1731 Casing Pressures Table***. The pressure remained fairly constant over the course of the quarter. The casing pressure in the water well SJ 1737 has shown an overall decrease from 9 oz. in January of 2011 to .5 oz. June 16, 2017. An overall decreasing trend has existed in the water well casing since 2011.

A gas sample was collected at SJ 1737 and Federal 18-1T on June 16, 2016. The sample results from this event are attached respectively ***2017-6-27 1737 Sample and 2017-6-27 Fed 18-1T Sample.***

Recommendations

Groundwater samples will continue to be collected quarterly to monitor the benzene concentration in this well. Chlorides, pH, TDS and EC remained constant over the 2nd quarter, and are very close to the background levels obtained in water well 1737. XTO proposes the continued operation of the vacuum pump and water pump at the Federal 18 #1T. Groundwater samples will continue to be collected on a quarterly basis until benzene levels remain below the WQCC standards for four (4) consecutive quarters. An alternative sampling schedule may be recommended at that time.

Logan Hixon
EHS Coordinator
XTO Energy, Inc.
Western Division

Federal 18 #1T Water Results

Date	Lab	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylene (ppb)	Chlorides (ppm)	TDS (ppm)	EC (umhos/cm)	pH	Purge Water Volume
NA	NA	10	750	750	620	250	1000	NA	6 thru 9	NA
9/24/2010	ESC	**150**	BDL	76	**670**	NS	NS	NS	NS	NA
9/24/2010	ESC	**190**	170	24	210	**6800**	**13000**	18000	6.1	NA
9/24/2010	Etech	**143**	221	63.6	**950**	NS	NS	NS	NS	NA
9/24/2010	Etech	**320**	377	31.8	568	**7150**	**11100**	16000	**5.84**	NA
12/10/2011	Hall	NS	NS	NS	NS	**2800**	**7610**	8900	6.36	3032.5
1/5/2011	Hall	**67**	93	7.9	25	NS	NS	NS	NS	7,798
1/5/2011	ESC	**73**	99	10	39	**1600**	**4800**	6000	6.6	7,798
1/29/2011	ESC	**60**	93	10	33	**930**	NS	4900	6.4	10791.0
2/28/2011	ESC	**42**	60	6.1	20	**550**	**3400**	4000	6.7	14795.0
4/1/2011	ESC	**23**	27	1.8	6.8	**260**	**2700**	3100	6.8	31237.5
4/29/2011	ESC	**29**	28	2.4	7.3	140	**2600**	2900	6.9	50217.0
5/31/2011	ESC	**14**	19	1.4	4.9	89	**2500**	2800	6.7	76513.0
6/14/2011	ESC	**55**	81	2.8	15	73	**2500**	2700	6.7	88120.0
6/30/2011	ESC	**52**	67	2.6	12	61	**2500**	2700	6.9	101208.5
8/15/2011	ESC	**21**	25	1.2	5.8	44	**2500**	2600	6.8	140267.0
9/2/2011	ESC	**10**	12	0.64	3.2	41	**2500**	2600	7.2	155801.0
9/16/2011	ESC	9.6	11	0.64	3	38	**2400**	2500	7.2	168040.0
9/30/2011	ESC	7.2	8.7	0.64	2.5	35	**2500**	2600	7	180392.5
10/28/2011	ESC	5.1	BDL	1.8	2.7	31	**2300**	2600	6.9	205,220
11/30/2011	ESC	4	BDL	3.9	2	27	**2500**	2600	7.1	233,487.5
12/30/2011	ESC	3.4	BDL	BDL	2.9	27	**2500**	2500	7.5	261,390.5
4/3/2012	ESC	6	BDL	BDL	1.6	NS	NS	NS	NS	351,300
4/9/2012	ESC	NS	NS	NS	NS	19	**2400**	2400	7.4	NA
7/3/2012	ESC	5.3	BDL	BDL	BDL	16	**2300**	2400	7.4	NA
7/6/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	441,053
9/19/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	521,271
9/27/2012	ESC	6.2	BDL	BDL	BDL	15	**2300**	2500	7.1	NA
12/14/2012	NA	NS	NS	NS	NS	NS	NS	NS	NS	598,540
12/31/2012	Etech	**13.9**	1.1	ND	3.3	15.5	**2690**	2440	7.05	604,689
1/23/2013	ESC	**160**	190	BDL	26	15	**2400**	2500	8	PUMP SHUT OFF
2/22/2013	ESC	7.1	77	BDL	1.8	15	**2100**	2500	7.1	605,860
5/2/2013	ESC	9	6.9	BDL	BDL	15	**2400**	2600	7.5	612,601
8/19/2013	ESC	**20**	11	BDL	2.3	16	**2200**	2600	7.2	NA
9/23/2013	ESC	**13**	11	BDL	2.2	16	**2300**	2500	7.1	621,744
11/25/2013	ESC	4.6	5.2	BDL	BDL	15	**2200**	2700	7.7	631,430
2/4/2014	ESC									636,120
10/1/2015	ESC	**54.2**	57	1.37	9.77	21.3	**2260**	2640	6.98	639,410
10/20/2015	ESC	**42.3**	39.9	0.964	7.06	18.1	**2330**	1460	7.09	642,650
3/28/2016	ESC	**38**	34.1	0.835	4.82	21.6	**2230**	2570	6.86	650,850
6/14/2016	ESC	**78.3**	58.4	1.16	7.22	13.7	**2890**	2600	6.89	704,371
8/29/2016	ESC	**19**	BDL	BDL	2.18	14.8	**2410**	2590	7.02	763,261
11/18/2016	ESC	**13.2**	5.61	BDL	2.33	13.9	**2470**	2580	7.03	842,610
3/31/2017	ESC	9.61	7.87	BDL	BDL	14.4	**2300**	2570	7.28	858,190
6/16/2017	ESC	**64.6**	29.2	0.781	5.4	14.2	**2360**	2570	7.05	927,854
11/5/2010	**ESC**	**ND**	**5.2**	**ND**	**ND**	**15**	**1400**	**2600**	**7.2**	**NA**

BDL = Below Detection Limits
NS = Not Sampled
Values in **BOLD** exceed WQCC Standards
Baseline Sample (Well SJ 1737)
WQCC Standards

Federal 18 #1T Gas Vented

Date	SCFM	ACFM	Gas Vented Total (MCF)
4/7/2017	3	6	19791.2
4/14/2017	3	6	19851.6
4/21/2017	3	6	19912
4/28/2017	3	6	19972.4
5/5/2017	3	6	20032.8
5/12/2017	3	6	20093.2
5/19/2017	3	6	20153.6
5/26/2017	3	6	20214
6/2/2017	3	6	20274.4
6/9/2017	3	6	20334.8
6/16/2017	3	6	20395.2
6/23/2017	3	6	20455.6
6/30/2017	3	6	20516

Well SJ 1737 Casing Pressures

Date	Casing Pressure (oz)
4/7/2017	0.5
6/16/2017	0.5

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ANALYTICAL REPORT

June 27, 2017

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REAL TIME DATA ACCESS

XTO Energy - San Juan Division

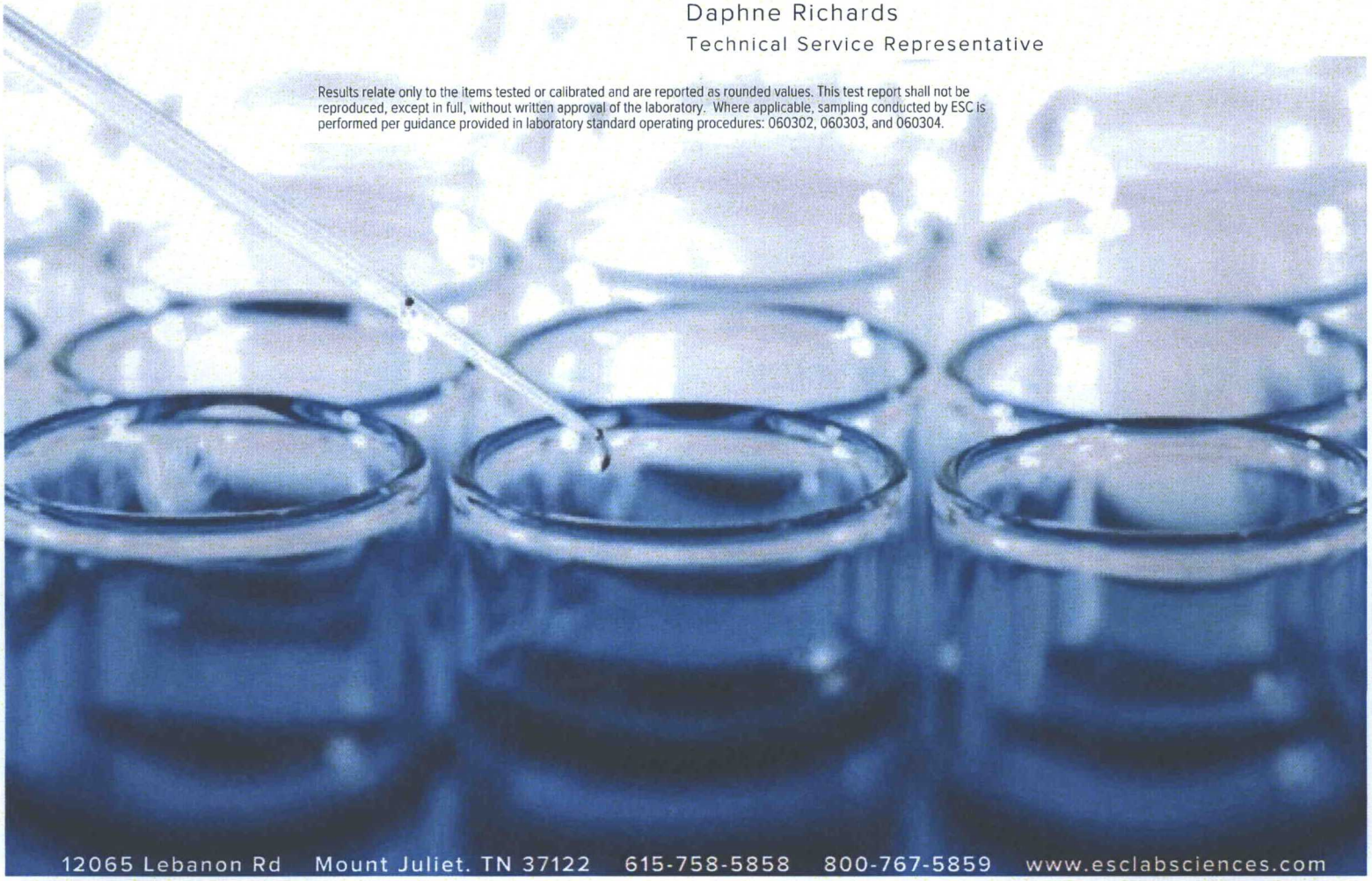
Sample Delivery Group:	L916830
Samples Received:	06/17/2017
Project Number:	
Description:	Federal 18-IT

Report To:

James McDaniel
382 County Road 3100
Aztec, NM 87410

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Technical Service Representative



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ONE LAB. NATIONWIDE.

18-IT TUBING L916830-01 GW

Collected by	Collected date/time	Received date/time
Logan H	06/16/17 12:20	06/17/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG992052	1	06/23/17 14:22	06/23/17 15:01	MMF
Wet Chemistry by Method 9040C	WG990383	1	06/19/17 16:04	06/19/17 16:04	MHM
Wet Chemistry by Method 9050A	WG990652	1	06/19/17 20:39	06/19/17 20:39	MAJ
Wet Chemistry by Method 9056A	WG992494	1	06/24/17 13:12	06/24/17 13:12	DR
Volatile Organic Compounds (GC) by Method 8021B	WG991346	1	06/26/17 17:49	06/26/17 17:49	BMB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Technical Service Representative

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	2360		10.0	1	06/23/2017 15:01	WG992052

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.05	T8	1	06/19/2017 16:04	WG990383

Sample Narrative:

9040C L916830-01 WG990383: 7.05 at 13.4c

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	umhos/cm			date / time	
Specific Conductance	2570		1	06/19/2017 20:39	WG990652

Sample Narrative:

9050A L916830-01 WG990652: 2571 at 20.4c

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	14.2		1.00	1	06/24/2017 13:12	WG992494

Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	0.0646		0.000500	1	06/26/2017 17:49	WG991346
Toluene	0.0292		0.00100	1	06/26/2017 17:49	WG991346
Ethylbenzene	0.000781		0.000500	1	06/26/2017 17:49	WG991346
Total Xylene	0.00540		0.00150	1	06/26/2017 17:49	WG991346
(S) a,a,a-Trifluorotoluene(PID)	*102*		*80.0-121*		*06/26/2017 17:49*	WG991346

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3228485-1 06/23/17 15:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	4.00	J	2.82	10.0

L916923-07 Original Sample (OS) • Duplicate (DUP)

(OS) L916923-07 06/23/17 15:01 • (DUP) R3228485-4 06/23/17 15:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	536	540	1	0.743		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3228485-2 06/23/17 15:01 • (LCSD) R3228485-3 06/23/17 15:01

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Dissolved Solids	8800	8500	8610	96.6	97.8	85.0-115			1.29	5

L916846-01 Original Sample (OS) • Duplicate (DUP)

(OS) L916846-01 06/19/17 16:04 • (DUP) WG990383-4 06/19/17 16:04

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	5.61	5.60	1	0.178		1

L916773-02 Original Sample (OS) • Duplicate (DUP)

(OS) L916773-02 06/19/17 16:04 • (DUP) WG990383-3 06/19/17 16:04

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	8.21	8.22	1	0.122	T8	1

L916846-01 Original Sample (OS) • Duplicate (DUP)

(OS) L916846-01 06/19/17 16:04 • (DUP) WG990383-4 06/19/17 16:04

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	5.61	5.60	1	0.178	T8	1

L916846-01 Original Sample (OS) • Duplicate (DUP)

(OS) L916846-01 06/19/17 16:04 • (DUP) WG990383-4 06/19/17 16:03

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	5.61	5.60	1	0.178	T8	1

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG990383-1 06/19/17 16:04 • (LCSD) WG990383-2 06/19/17 16:03

Analyte	Spike Amount su	LCS Result su	LCSD Result su	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
pH	6.38	6.36	6.32	99.7	99.1	98.7-101			0.631	1

Laboratory Control Sample (LCS)

(LCS) WG990383-1 06/19/17 16:03

Analyte	Spike Amount su	LCS Result su	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	6.38	6.36	99.7	98.7-101	

Method Blank (MB)

(MB) WG990652-5 06/19/17 20:39

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	1.61			

L916766-05 Original Sample (OS) • Duplicate (DUP)

(OS) L916766-05 06/19/17 20:39 • (DUP) WG990652-1 06/19/17 20:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	19600	19600	1	0.153		20

L916889-08 Original Sample (OS) • Duplicate (DUP)

(OS) L916889-08 06/19/17 20:39 • (DUP) WG990652-4 06/19/17 20:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	969	969	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG990652-2 06/19/17 20:39 • (LCSD) WG990652-3 06/19/17 20:39

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	1070	1070	1070	100	100	90.0-110			0.000	20

Method Blank (MB)

(MB) R3228642-1 06/24/17 05:57

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Chloride	U		0.0519	1.00

L916829-23 Original Sample (OS) • Duplicate (DUP)

(OS) L916829-23 06/24/17 12:46 • (DUP) R3228642-4 06/24/17 12:59

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Chloride	63.1	62.8	1	0		15

L916923-07 Original Sample (OS) • Duplicate (DUP)

(OS) L916923-07 06/24/17 20:28 • (DUP) R3228642-8 06/24/17 20:41

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Chloride	22.6	22.3	1	1		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3228642-2 06/24/17 06:10 • (LCSD) R3228642-3 06/24/17 06:23

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Chloride	40.0	39.5	39.6	99	99	80-120			0	15

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3228775-3 06/21/17 11:08

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Benzene	U		0.000190	0.000500
Toluene	U		0.000412	0.00100
Ethylbenzene	U		0.000160	0.000500
Total Xylene	U		0.000510	0.00150
(S) a,a,a-Trifluorotoluene(PID)	*106*			*80.0-121*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3228775-1 06/21/17 09:56 • (LCSD) R3228775-2 06/21/17 10:20

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.0500	0.0566	0.0567	113	113	71.0-121			0.210	20
Toluene	0.0500	0.0578	0.0566	116	113	72.0-120			2.20	20
Ethylbenzene	0.0500	0.0581	0.0576	116	115	75.0-122			0.880	20
Total Xylene	0.150	0.176	0.173	117	115	74.0-124			1.83	20
(S) a,a,a-Trifluorotoluene(PID)				*107*	*106*	*80.0-121*				

L916806-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L916806-15 06/21/17 12:09 • (MS) R3228775-4 06/21/17 18:21 • (MSD) R3228775-5 06/21/17 18:45

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Benzene	0.0500	0.0984	0.151	0.150	106	104	1	29.0-146			0.510	20
Toluene	0.0500	0.0103	0.0613	0.0629	102	105	1	35.0-140			2.60	20
Ethylbenzene	0.0500	0.103	0.155	0.155	106	105	1	39.0-143			0.190	20
Total Xylene	0.150	0.0108	0.168	0.175	105	110	1	42.0-142			4.14	20
(S) a,a,a-Trifluorotoluene(PID)					*110*	*110*		*80.0-121*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [14]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

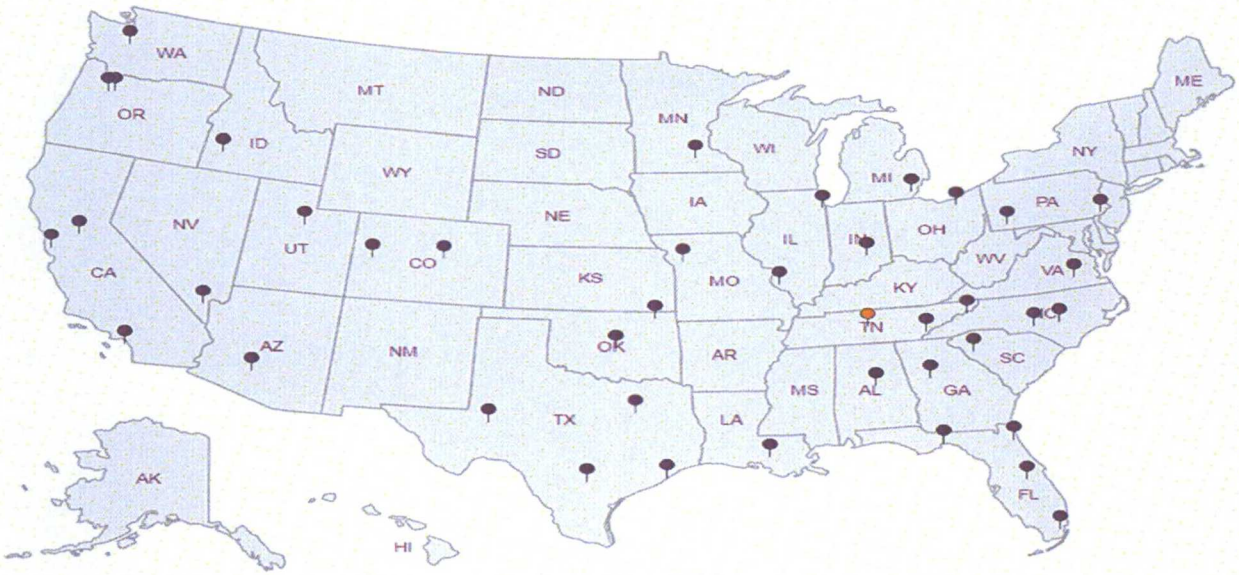
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



1071

XTO ENERGY
Western Division

Quote Number	Page ___ of ___	
XTO Contact: Logan	XTO Contact Phone #: 505 386-9018	
Email Results to: James, Kurt, Logan		
Well Site/Location: Federal 18-1T	API Number	Saturday Delivery (Y / N)
Collected By: Logan H	Samples on Ice: (Y) / N	Turnaround: (X) Standard; ___ Next Day; ___ Two Day; ___ Three Day; ___ Same Day
Company: XTO	Test Reason: GW	
Signature	Gray Areas for Lab Use Only!	Date Needed ___

Analysis/Container: 8021 (XTEX) | EC | pH | TDS | Chlorides

Lab Information: 1916830

Office Abbreviations
Farmington = FAR
Durango = DUR
Bakken = BAK
Raton = RAT
Piceance = PC
Roosevelt = RSV
La Barge = LB
Orangeville = OV

A208

Sample ID	Sample Name	Media	Date	Time	Preservative	No. of Conts.	Sample Number
18-1T Tubing		GW	6-16	1220	Cool	3-40ml 2-1L	-91

Media: Filter = F Soil = S Wastewater = WW Groundwater = GW Drinking Waster = DW Sludge = SG Surface Water = SW Air = A Drill Mud = DM Other = OT

Relinquished By: (Signature)	Date: 6-16-17	Time: 1520	Received By: (Signature)	Number of Bottles: 5	Sample Condition
Relinquished By: (Signature)	Date:	Time:		Temperature: 3.1 M	Other Information
Relinquished By: (Signature)	Date:	Time:	Received for Lab by: (Signature)	Date: 6/17/17 Time: 0815	OK

Comments: FedEX 6127 6739 4300

* Sample ID will be the office and sampler-date-military time FARJM-MMDDYY-1200

ESC LAB SCIENCES
Cooler Receipt Form

Client:	SDG#	L916830
Cooler Received/Opened On: 6/17/17	3.1 Temperature:	
Received By: Keith Hargis		
Signature:		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			
COC Signed / Accurate?			
Bottles arrive intact?			
Correct bottles used?			
Sufficient volume sent?			
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

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Analysis Certificate

Analysis Requested: **GPA 2286_14**

Client:	XTO	Project #:	98031-0528
Site Name:	Federal 18-IT Casing	Compensations:	Air & Helium Free
Meter ID:	Federal 18-IT Casing	Date Reported:	06-27-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

GPA 2286_14 report

Components	Mol %	Wt %	L.V. %
Helium	BRL	BRL	BRL
Oxygen	BRL	BRL	BRL
Nitrogen	BRL	BRL	BRL
Carbon Dioxide	0.0334	0.0914	0.0590
Methane	99.7831	99.4811	99.7050
Ethane	0.1275	0.2380	0.1770
Propane	0.0320	0.0876	0.0590
Iso-Butane	0.0070	0.0255	BRL
N-Butane	0.0067	0.0242	BRL
Iso-Pentane	0.0033	0.0149	BRL
N-Pentane	0.0020	0.0087	BRL
iso-Hexanes	0.0031	0.0168	BRL
Benzene	0.0002	0.0010	BRL
n-Hexane	0.0001	0.0005	BRL
iso-Heptanes	0.0014	0.0088	BRL
Toluene	BRL	BRL	BRL
n-Heptane	BRL	BRL	BRL
iso-Octanes	0.0001	0.0007	BRL
n-Octane	BRL	BRL	BRL
n-Nonane	BRL	BRL	BRL
iso-Decanes	BRL	BRL	BRL
n-Decane	BRL	BRL	BRL
Totals	**100.0000**	**100.0000**	**100.0000**

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

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Analysis Certificate

Analysis Requested: GPA 2286_14

Client:	XTO	Project #:	98031-0528
Site Name:	Federal 18-IT Casing	Compensations:	Air & Helium Free
Meter ID:	Federal 18-IT Casing	Date Reported:	06-27-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

GPA 2261_13 Report

Components	Mol %	Wt %	L.V. %
Hydrogen Sulfide	BRL	BRL	BRL
Helium	BRL	BRL	BRL
Oxygen	BRL	BRL	BRL
Nitrogen	BRL	BRL	BRL
Carbon Dioxide	0.0334	0.0914	0.0590
Methane	99.7831	99.4811	99.7050
Ethane	0.1275	0.2380	0.1770
Propane	0.0320	0.0876	0.0590
Iso-Butane	0.0070	0.0255	BRL
N-Butane	0.0067	0.0242	BRL
Iso-Pentane	0.0033	0.0149	BRL
N-Pentane	0.0020	0.0087	BRL
C6+	0.0050	0.0286	BRL
Totals	**100.0000**	**100.0000**	**100.0000**

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

Group Reports

Components	Mol %	Wt %	L.V. %
Hexanes	0.0034	0.0183	BRL
Heptanes	0.0014	0.0088	BRL
Octanes	0.0001	0.0007	BRL
Nonanes	0.0001	0.0008	BRL
Heaviers	BRL	BRL	BRL
Totals	**0.0050**	**0.0286**	**0.0000**

C6+	0.0050	0.0286	BRL
C7+	0.0016	0.0103	BRL
C8+	0.0002	0.0015	BRL
C9+	0.0001	0.0008	BRL

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

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Analysis Certificate

Analysis Requested: **GPA 2286_14**

Client:	XTO	Project #:	98031-0528
Site Name:	Federal 18-IT Casing	Compensations:	Air & Helium Free
Meter ID:	Federal 18-IT Casing	Date Reported:	06-27-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

Glycal Report

Components	Mol %	Wt %	L.V. %
Hydrogen Sulfide	BRL	BRL	BRL
Nitrogen	BRL	BRL	BRL
Carbon Dioxide	0.0334	0.0914	0.0590
Methane	99.7831	99.4811	99.7050
Ethane	0.1275	0.2380	0.1770
Propane	0.0320	0.0876	0.0590
Iso-Butane	0.0070	0.0255	BRL
N-Butane	0.0067	0.0242	BRL
Iso-Pentane	0.0033	0.0149	BRL
N-Pentane	0.0020	0.0087	BRL
Cyclopentane	BRL	BRL	BRL
Other Hexanes	0.0031	0.0168	BRL
Benzene	0.0002	0.0010	BRL
n-Hexane	0.0001	0.0005	BRL
Cyclohexane	BRL	BRL	BRL
Other Heptanes	0.0012	0.0076	BRL
Toluene	BRL	BRL	BRL
n-Heptane	BRL	BRL	BRL
Methylcyclohexane	0.0002	0.0012	BRL
Other Octanes	0.0001	0.0007	BRL
n-Octane	BRL	BRL	BRL
2,2,4 Trimethylpentane	BRL	BRL	BRL
EthylBenzene	BRL	BRL	BRL
Xylenes	BRL	BRL	BRL
Nonanes	0.0001	0.0008	BRL
Heaviers	BRL	BRL	BRL
Totals	**100.0000**	**100.0000**	**100.0000**

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

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Client:	XTO	Project #:	98031-0528
Site Name:	Federal 18-IT Casing	Compensations:	Air & Helium Free
Meter ID:	Federal 18-IT Casing	Date Reported:	06-27-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

GPA 2172_09 Report Calculations @ 14.73 psia and 60 degrees F

Compressibility Factor Dry Gas	0.998	Compressibility Factor Sat Gas	0.9977
GPM C2+	0.051	GPM C3+	0.017
GPM C4+	0.008	GPM C5+	0.004
Ideal Dry Gas Relative Density:	0.556	Ideal Sat Gas Relative Density:	0.546
Real Dry Gas Relative Density:	0.556	Real Sat Gas Relative Density:	0.547
Dry Molecular Weight:	16.091	Sat Molecular Weight:	15.811
Gross HV per Ideal Dry ft3:	1014.08	Gross HV per Ideal Sat ft3:	996.43
Gross HV per Real Dry ft3:	1016.12	Gross HV per Real Sat ft3:	998.73

C6+ Calculations

Ideal C6+ Dry Relative Density	3.16	C6+ Dry Molecular Weight	91.522
C6+ Compressibility Factor	0.894	C6+ Gross HV per Ideal Dry ft3	5029

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

Irene Yazzie — 6/27/2017

Analyst — Date

Irene Yazzie

Printed

Comments: Sample did not have a tag, also sample had low pressure < 20psi.

Note: The above analyses are performed in compliance with GPA 2286_14 quality assurance procedures.

References: GPA 2286_14, TP-17, GPA Standard 2145-09 and GPA Standard 2172-09

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Analysis Certificate

Analysis Requested: **GPA 2286_14**

Client:	XTO	Project #:	98031-0528
Site Name:	SJ 1737 Casing	Compensations:	Air & Helium Free
Meter ID:	SJ 1737 Casing	Date Reported:	06-26-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

GPA 2286_14 report

Components	Mol %	Wt %	L.V. %
Helium	BRL	BRL	BRL
Oxygen	BRL	BRL	BRL
Nitrogen	33.7920	45.2314	24.3300
Carbon Dioxide	0.8014	1.6853	0.9160
Methane	61.9294	47.4709	68.6720
Ethane	2.7330	3.9267	4.7740
Propane	0.5975	1.2590	1.0460
Iso-Butane	0.0707	0.1964	0.1310
N-Butane	0.0550	0.1529	0.1310
Iso-Pentane	0.0115	0.0397	BRL
N-Pentane	0.0035	0.0119	BRL
iso-Hexanes	0.0042	0.0173	BRL
Benzene	0.0001	0.0004	BRL
n-Hexane	0.0001	0.0004	BRL
iso-Heptanes	0.0015	0.0072	BRL
Toluene	BRL	BRL	BRL
n-Heptane	BRL	BRL	BRL
iso-Octanes	0.0001	0.0005	BRL
n-Octane	BRL	BRL	BRL
n-Nonane	BRL	BRL	BRL
iso-Decanes	BRL	BRL	BRL
n-Decane	BRL	BRL	BRL
Totals	**100.0000**	**100.0000**	**100.0000**

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

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Analysis Requested: **GPA 2286_14**

Client:	XTO	Project #:	98031-0528
Site Name:	SJ 1737 Casing	Compensations:	Air & Helium Free
Meter ID:	SJ 1737 Casing	Date Reported:	06-26-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

GPA 2261_13 Report

Components	Mol %	Wt %	L.V. %
Hydrogen Sulfide	BRL	BRL	BRL
Helium	BRL	BRL	BRL
Oxygen	BRL	BRL	BRL
Nitrogen	33.7920	45.2314	24.3300
Carbon Dioxide	0.8014	1.6853	0.9160
Methane	61.9294	47.4709	68.6720
Ethane	2.7330	3.9267	4.7740
Propane	0.5975	1.2590	1.0460
Iso-Butane	0.0707	0.1964	0.1310
N-Butane	0.0550	0.1529	0.1310
Iso-Pentane	0.0115	0.0397	BRL
N-Pentane	0.0035	0.0119	BRL
C6+	0.0060	0.0258	BRL
Totals	**100.0000**	**100.0000**	**100.0000**

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

Group Reports

Components	Mol %	Wt %	L.V. %
Hexanes	0.0044	0.0181	BRL
Heptanes	0.0015	0.0072	BRL
Octanes	0.0001	0.0005	BRL
Nonanes	BRL	BRL	BRL
Heaviers	BRL	BRL	BRL
Totals	**0.0060**	**0.0258**	**0.0000**

C6+	0.0060	0.0258	BRL
C7+	0.0016	0.0077	BRL
C8+	0.0001	0.0005	BRL
C9+	BRL	BRL	BRL

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

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Analysis Requested: **GPA 2286_14**

Client:	XTO	Project #:	98031-0528
Site Name:	SJ 1737 Casing	Compensations:	Air & Helium Free
Meter ID:	SJ 1737 Casing	Date Reported:	06-26-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

Glycal Report

Components	Mol %	Wt %	L.V. %
Hydrogen Sulfide	BRL	BRL	BRL
Nitrogen	33.7920	45.2314	24.3300
Carbon Dioxide	0.8014	1.6853	0.9160
Methane	61.9294	47.4709	68.6720
Ethane	2.7330	3.9267	4.7740
Propane	0.5975	1.2590	1.0460
Iso-Butane	0.0707	0.1964	0.1310
N-Butane	0.0550	0.1529	0.1310
Iso-Pentane	0.0115	0.0397	BRL
N-Pentane	0.0035	0.0119	BRL
Cyclopentane	BRL	BRL	BRL
Other Hexanes	0.0042	0.0173	BRL
Benzene	0.0001	0.0004	BRL
n-Hexane	0.0001	0.0004	BRL
Cyclohexane	BRL	BRL	BRL
Other Heptanes	0.0014	0.0067	BRL
Toluene	BRL	BRL	BRL
n-Heptane	BRL	BRL	BRL
Methylcyclohexane	0.0001	0.0005	BRL
Other Octanes	0.0001	0.0005	BRL
n-Octane	BRL	BRL	BRL
2,2,4 Trimethylpentane	BRL	BRL	BRL
EthylBenzene	BRL	BRL	BRL
Xylenes	BRL	BRL	BRL
Nonanes	BRL	BRL	BRL
Heaviers	BRL	BRL	BRL
Totals	**100.0000**	**100.0000**	**100.0000**

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

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Analysis Certificate

Analysis Requested: **GPA 2286_14**

Client:	XTO	Project #:	98031-0528
Site Name:	SJ 1737 Casing	Compensations:	Air & Helium Free
Meter ID:	SJ 1737 Casing	Date Reported:	06-26-17
Sampled by:	Logan Hixon	Date Sampled:	06-16-17
Analyzed by:	Irene Yazzie	Date Received:	06-16-17
Sample Pressure:	psig	Date Analyzed:	06-23-17
Sample Temperature:	F	Analysis Time:	Std

GPA 2172_09 Report Calculations @ 14.73 psia and 60 degrees F

Compressibility Factor Dry Gas	0.9986	Compressibility Factor Sat Gas	0.9983
GPM C2+	0.944	GPM C3+	0.213
GPM C4+	0.048	GPM C5+	0.008
Ideal Dry Gas Relative Density:	0.723	Ideal Sat Gas Relative Density:	0.71
Real Dry Gas Relative Density:	0.723	Real Sat Gas Relative Density:	0.711
Dry Molecular Weight:	20.929	Sat Molecular Weight:	20.564
Gross HV per Ideal Dry ft3:	695.46	Gross HV per Ideal Sat ft3:	683.35
Gross HV per Real Dry ft3:	696.44	Gross HV per Real Sat ft3:	684.52

C6+ Calculations

Ideal C6+ Dry Relative Density	3.119	C6+ Dry Molecular Weight	90.329
C6+ Compressibility Factor	0.899	C6+ Gross HV per Ideal Dry ft3	4978.9

BRL = Value below the method reportable limit = 0.0001% **N/R = Parameter not recorded**

Irene Yazzie — 6/26/2017

Analyst — Date

Irene Yazzie

Printed

Comments: Sample did not have a tag.

Note: The above analyses are performed in compliance with GPA 2286_14 quality assurance procedures.

References: GPA 2286_14, TP-17, GPA Standard 2145-09 and GPA Standard 2172-09

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