



**Federal 18 #1T Remediation System  
2016 4th Quarter Report**

**Submitted By:**

**Logan Hixon  
EHS Coordinator  
XTO Energy, Inc.  
505-333-3683**

OIL CONS. DIV DIST. 3  
JAN 19 2017

**Submitted to:**

**Brandon Powell  
New Mexico Oil Conservation Division  
1000 Rio Brazos Road  
Aztec, New Mexico  
505-334-6178 Ext 116**

**December 2016**

## Table of Contents

<i>Introduction .....</i>	<i>1</i>
<i>History .....</i>	<i>1</i>
<i>3rd Quarter Activities.....</i>	<i>2</i>
<i>Recommendations .....</i>	<i>3</i>

### ***Tables***

*Federal 18 #1T Water Results*  
*Federal 18 #1T Gas Vented*  
*Well SJ 1737 Casing Pressure*

### ***Attachments***

*Water Analysis Lab Report*

## **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 recently 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. Both the vacuum pump and the water pump were powered by a portable generator placed on-site.

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.

#### **4th quarter Activities**

During the 4th quarter of 2016, the system ran continuously with no down time. As of December 30, 2016, approximately 18,945.6 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 842,610.6 gallons of water have been removed from the Federal 18 #1T as of December 30, 2016. The attached ***Federal 18 #1T Water Results Table*** shows that that benzene concentrations have had a reduction in the quarter with one (1) sampling event (November 18, 2016) returning results above the WQCC standard at 13.2 ppb. Chloride levels have remained constant through the quarter, remaining steady at 13.9 ppm. pH values remained constant in the quarter, returning results of 7.03. TDS continues to be above WQCC standards at 2740 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 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 0 oz. December 28, 2016. An overall decreasing trend has existed in the water well casing since 2011.

### **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 4th 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
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)
10/7/2016	3	6	18220.8
10/14/2016	3	6	18281.2
10/21/2016	3	6	18341.6
10/28/2016	3	6	18402
11/4/2016	3	6	18462.4
11/11/2016	3	6	18522.8
11/18/2016	3	6	18583.2
11/25/2016	3	6	18643.6
12/2/2016	3	6	18704
12/9/2016	3	6	18764.4
12/16/2016	3	6	18824.8
12/23/2016	3	6	18885.2
12/30/2016	3	6	18945.6

**Well SJ 1737 Casing Pressures**

Date	Casing Pressure (oz)
10/12/2016	0.5
11/2/2016	1
11/21/2016	0.5
12/28/2016	0

December 02, 2016

## XTO Energy - San Juan Division

Sample Delivery Group: L874637  
Samples Received: 11/23/2016  
Project Number:  
Description: Federal 18-IT

Report To: James McDaniel  
382 County Road 3100  
Aztec, NM 87410

Entire Report Reviewed By:



Daphne Richards  
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.





<sup>1</sup> Cp: Cover Page	1
<sup>2</sup> Tc: Table of Contents	2
<sup>3</sup> Ss: Sample Summary	3
<sup>4</sup> Cn: Case Narrative	4
<sup>5</sup> Sr: Sample Results	5
18-1T TUBING L874637-01	5
<sup>6</sup> Qc: Quality Control Summary	6
Gravimetric Analysis by Method 2540 C-2011	6
Wet Chemistry by Method 9040C	7
Wet Chemistry by Method 9050A	8
Wet Chemistry by Method 9056A	9
Volatile Organic Compounds (GC) by Method 8021B	10
<sup>7</sup> Gl: Glossary of Terms	11
<sup>8</sup> Al: Accreditations & Locations	12
<sup>9</sup> Sc: Chain of Custody	13

<sup>1</sup> Cp<sup>3</sup> Ss<sup>4</sup> Cn<sup>5</sup> Sr<sup>6</sup> Qc<sup>7</sup> Gl<sup>8</sup> Al<sup>9</sup> Sc

## SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



18-1T TUBING L874637-01 GW

Method	Batch	Dilution	Collected by	Collected date/time	Received date/time
			Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG929758	1	11/25/16 23:11	11/25/16 23:45	JM
Volatile Organic Compounds (GC) by Method 8021B	WG929893	1	12/01/16 18:27	12/01/16 18:27	DAH
Wet Chemistry by Method 9040C	WG929529	1	11/30/16 12:17	11/30/16 12:17	JJL
Wet Chemistry by Method 9050A	WG929630	1	11/26/16 16:48	11/26/16 16:48	MAJ
Wet Chemistry by Method 9056A	WG930124	1	11/29/16 16:35	11/29/16 16:35	KCF

1 Cr

2 Tc

4 Cr

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



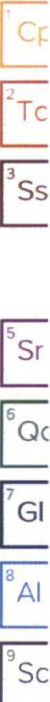
All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within 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 Richards  
Technical Service Representative

### Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
<u>L874637-01</u>	<u>18-1T TUBING</u>	9040C





## Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Dissolved Solids	2470		10.0	1	11/25/2016 23:45	<a href="#">WG929758</a>

## Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.03		1	11/30/2016 12:17	<a href="#">WG929529</a>

## Sample Narrative:

9040C L874637-01 WG929529: 7.03 at 19.4c

## Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2580		1	11/26/2016 16:48	<a href="#">WG929630</a>

## Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chloride	13.9		1.00	1	11/29/2016 16:35	<a href="#">WG930124</a>

## Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.0132		0.000500	1	12/01/2016 18:27	<a href="#">WG929893</a>
Toluene	0.00561		0.00500	1	12/01/2016 18:27	<a href="#">WG929893</a>
Ethylbenzene	ND		0.000500	1	12/01/2016 18:27	<a href="#">WG929893</a>
Total Xylene	0.00233		0.00150	1	12/01/2016 18:27	<a href="#">WG929893</a>
(S) a,a,a-Trifluorotoluene(PID)	104		55.0-122		12/01/2016 18:27	<a href="#">WG929893</a>

WG929758

Gravimetric Analysis by Method 2540 C-2011

## QUALITY CONTROL SUMMARY

L874637-01

ONE LAB. NATIONWIDE.



## Method Blank (MB)

(MB) R3181334-1 11/25/16 23:45

	MB Result	<u>MB Qualifier</u>	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

## L874637-01 Original Sample (OS) • Duplicate (DUP)

(OS) L874637-01 11/25/16 23:45 • (DUP) R3181334-4 11/25/16 23:45

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	2470	2470	1	0.000		5

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

(LCS) R3181334-2 11/25/16 23:45 • (LCSD) R3181334-3 11/25/16 23:45

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Dissolved Solids	8800	8370	8790	95.1	99.9	85.0-115			4.90	5

Cp
<sup>2</sup> Tc
<sup>3</sup> Ss
<sup>4</sup> Cr
<sup>5</sup> Sr
<sup>7</sup> Gl
<sup>8</sup> Al
<sup>9</sup> Sc

WG929529

Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY

L874637-01

ONE LAB, NATIONWIDE.



## L874621-01 Original Sample (OS) • Duplicate (DUP)

(OS) L874621-01 11/30/16 12:17 • (DUP) WG929529-3 11/30/16 12:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	4.10	4.10	1	0.000	1	

## L875065-02 Original Sample (OS) • Duplicate (DUP)

(OS) L875065-02 11/30/16 12:17 • (DUP) WG929529-4 11/30/16 12:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.87	7.85	1	0.254	1	

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

(LCS) WG929529-1 11/30/16 12:17 • (LCSD) WG929529-2 11/30/16 12:17

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.07	6.07	99.3	99.3	98.4-102			0.000	1

Cp

2 Tc

3 Ss

4 Cr

5 Sr

6

7 Gl

8 Al

9 Sc

WG929630

Wet Chemistry by Method 9050A

## QUALITY CONTROL SUMMARY

L874637-01

ONE LAB. NATIONWIDE.



## Method Blank (MB)

(MB) WG929630-4 11/26/16 16:48

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	0.970			

## L873847-01 Original Sample (OS) • Duplicate (DUP)

(OS) L873847-01 11/26/16 16:48 • (DUP) WG929630-1 11/26/16 16:48

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	150	150	1	0.133		20

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

(LCS) WG929630-2 11/26/16 16:48 • (LCSD) WG929630-3 11/26/16 16:48

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCSD Result umhos/cm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Specific Conductance	542	551	551	102	102	90.0-110			0.000	20

Cp

2 Tc

3 Ss

4 Cr

5 Sr

7 GI

8 AI

9 Sc

WG930124

Wet Chemistry by Method 9056A

## QUALITY CONTROL SUMMARY

ONE LAB, NATIONWIDE.



## Method Blank (MB)

(MB) R3181127-1 11/29/16 07:00

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

## L874357-01 Original Sample (OS) • Duplicate (DUP)

(OS) L874357-01 11/29/16 13:51 • (DUP) R3181127-5 11/29/16 14:35

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	52.5	49.4	1	6		15

## L874637-01 Original Sample (OS) • Duplicate (DUP)

(OS) L874637-01 11/29/16 16:35 • (DUP) R3181127-6 11/29/16 17:19

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	13.9	12.1	1	14		15

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

(LCS) R3181127-2 11/29/16 07:15 • (LCSD) R3181127-3 11/29/16 07:30

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Chloride	40.0	39.1	39.1	98	98	80-120			0	15

## L874206-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L874206-02 11/29/16 11:52 • (MS) R3181127-4 11/29/16 12:06

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/l	mg/l	mg/l	%		%	
Chloride	50.0	15.1	64.7	99	1	80-120	

## L874629-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L874629-03 11/29/16 17:34 • (MS) R3181127-7 11/29/16 17:49 • (MSD) R3181127-8 11/29/16 18:04

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chloride	50.0	7.34	58.9	58.7	103	103	1	80-120			0	15

Cp

2 Tc

3 Ss

4 Cr

5 Sr

7 Gl

8 Al

9 Sc



## Method Blank (MB)

(MB) R3182152-3 12/01/16 13:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000190	0.000500
Toluene	U		0.000180	0.00500
Ethylbenzene	U		0.000160	0.000500
Total Xylene	U		0.000510	0.00150
(S) a,a,a-Trifluorotoluene(PID) 105			55.0-122	

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

(LCS) R3182152-1 12/01/16 12:02 • (LCSD) R3182152-2 12/01/16 12:25

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 %
Benzene	0.0500	0.0492	0.0500	98.4	100	70.0-130			1.64	20
Toluene	0.0500	0.0504	0.0505	101	101	70.0-130			0.270	20
Ethylbenzene	0.0500	0.0514	0.0516	103	103	70.0-130			0.270	20
Total Xylene	0.150	0.158	0.158	106	105	70.0-130			0.210	20
(S) a,a,a-Trifluorotoluene(PID)				104	104	55.0-122				

## L874580-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L874580-01 12/01/16 15:15 • (MS) R3182152-4 12/01/16 14:02 • (MSD) R3182152-5 12/01/16 14:26

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	ND	0.0509	0.0506	101	100	1	57.2-131			0.550	20
Toluene	0.0500	ND	0.0506	0.0506	101	101	1	63.7-134			0.000	20
Ethylbenzene	0.0500	ND	0.0527	0.0527	105	105	1	67.5-135			0.0700	20
Total Xylene	0.150	ND	0.161	0.161	107	108	1	65.9-138			0.130	20
(S) a,a,a-Trifluorotoluene(PID)				104	104	55.0-122						



## Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
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
-----------	-------------

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

1 Cp

2 Tc

3 Ss

4 Cr

5 Sr

6 Qc

8 Al

9 Sc



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
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	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 <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>1,4</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	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	100789
A2LA - ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> 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.**




ACCOUNT:

PROJECT:

SDG:

DATE/TIME:

PAGE:

		Quote Number		Page <u>1</u> of <u>1</u>		Analysis/Container <div style="display: flex; justify-content: space-around; font-size: 1.2em;"> <span>1208 (XTE18)</span> <span>EC</span> <span>PH</span> <span>TDS</span> <span>Chlorides</span> </div>						Lab Information <b>F008</b>	
		XTO Contact <u>James / Logan</u>		XTO Contact Phone # <u>505 386-8018</u>									
		Well Site/Location <u>Federal 18-1T</u>		API Number		Saturday Delivery (Y/N) <u>(N)</u>		Office Abbreviations Farmington = FAR Durango = DUR Bakken = BAK Raton = RAT Piceance = PC Roosevelt = RSV La Barge = LB Orangeville = OV					
Collected By <u>Logan, H</u>		Samples on Ice <u>(Y) (N)</u>		Turnaround <u>(X) Standard</u>									
Company		Test Reason <u>1/4 GW</u>		<input type="checkbox"/> Next Day <input type="checkbox"/> Two Day <input type="checkbox"/> Three Day <input type="checkbox"/> Same Day Date Needed _____									
Signature <u>[Signature]</u>		Gray Areas for Lab Use Only!											
Sample ID	Sample Name	Media	Date	Time	Preservative	No. of Conts.	Sample Number <u>1874637-0</u>						
<u>18-1T Tuleing</u>	<u>18-1T</u>	<u>GW</u>	<u>11-18</u>	<u>10:00</u>	<u>Cool</u>	<u>1-500</u> <u>2-WAL</u>							

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

Relinquished By: (Signature) <u>[Signature]</u>	Date: <u>11-21-16</u>	Time: <u>700</u>	Received By: (Signature) <u>[Signature]</u>	Number of Bottles	Sample Condition <u>SW</u>
Relinquished By: (Signature)	Date:	Time:		Temperature <u>3.1</u>	
Relinquished By: (Signature)	Date:	Time:	Received for Lab by: (Signature) <u>[Signature]</u>	Date: <u>11-23-16</u>	Time: <u>0900</u>

Comments: [Signature]

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

FD 4/12/17 20 07



## Cooler Receipt Form

Client: <u>X705/MT</u>	SDG#	<u>687V637</u>		
Cooler Received/Opened On: <u>11/23/2016</u>	Temperature Upon Receipt:	<u>3.1 °C</u>		
Received By: <u>Nadiar Yakob</u>				
Signature: <u>Nadiar Yakob</u>				
Receipt Check List		Yes	No	N/A
Were custody seals on outside of cooler and intact?				<input checked="" type="checkbox"/>
Were custody papers properly filled out?		<input checked="" type="checkbox"/>		
Did all bottles arrive in good condition?		<input checked="" type="checkbox"/>		
Were correct bottles used for the analyses requested?		<input checked="" type="checkbox"/>		
Was sufficient amount of sample sent in each bottle?		<input checked="" type="checkbox"/>		
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)				<input checked="" type="checkbox"/>
If applicable, was an observable VOA headspace present?			<input checked="" type="checkbox"/>	
Non Conformance Generated. (If yes see attached NCF)				