3R - 124

2011 AGWMR

02 / 01 / 2012

XTO ENERGY

February 3, 2012

Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
(505) 476-3488

RE: Rowland Gas COM #1 – 2011 Annual Groundwater Report
OCD Case File No. – 3RP-124

Mr. Von Gonten,

Please find attached the ***2011 Annual Groundwater Report*** for the Rowland Gas Com #1 well site, located in Unit P, Section 25, Township 30N, Range 12W, San Juan County, New Mexico. If you have any questions or comments, please feel free to contact me at your convenience.

James McDaniel
EH&S Supervisor, CHMM #15676
XTO Energy, Inc.
(505) 333-3701

CERTIFIED HAZARDOUS MATERIALS MANAGER
JAMES P. McDANIEL
15676
CHMM
EXPIRES MAY 16, 2016

CC: Brandon Powell, OCD Aztec Division

2011 ANNUAL GROUNDWATER REPORT

Rowland Gas COM #1

3RP-124

Unit P, Section 25, Township 30N, Range 12W
San Juan County, New Mexico

PREPARED FOR:

Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Street
Santa Fe, New Mexico 87505
(505) 476-3488

January 2012

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Appendices

2011 XTO GROUNDWATER REPORT

ROWLAND GAS COM #1
3RP-124

SITE DETAILS

LEGALS - TWN: 30N **RNG:** 12W **SEC:** 25 **UNIT:** P
OCD HAZARD RANKING: 40 **LAND TYPE:** FEE
LATITUDE: 36.77894 **LONGITUDE:** 108.04329

INTRODUCTION

XTO Energy Inc. (XTO) acquired the Rowland Gas Com #1 well site from Amoco Production Company (Amoco) in January 1998. This is a gas producing well in the Dakota Sandstone and is currently active. There is a nearby irrigation ditch to the immediate west of this location. A topographic map is included as ***Figure 1***.

HISTORY

XTO learned that in August 1993 Amoco excavated and attempted to remediate an unlined production pit. During excavation groundwater was encountered at 13 feet below ground surface. Envirotech's Pit Closure Report is included as ***Attachment 1***. Monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-5 were installed in May 1996. Completion Diagrams and Borehole Logs are presented as ***Figure 3-7***. Groundwater analytical results from monitoring wells MW-1, MW-2 and MW-3 were below the New Mexico Water Quality Control Commission (WQCC) standards for benzene, toluene, ethyl benzene and total xylene (BTEX), and sampling was discontinued by Amoco in 1996 in accordance with the New Mexico Oil Conservation Division (OCD) approved Groundwater Management Plan. Groundwater from monitoring wells MW-4 and MW-5 returned BTEX concentrations in excess of WQCC standards. It was presumed that monitoring well MW-5 was installed in a location within or immediately adjacent to an abandoned dehydrator unit with an associated pit. At that time possible downgradient migration had not been fully delineated. Installation of an additional monitoring well was recommended.

Monitoring well MW-6 was installed in June 1997 to further delineate possible down gradient migration of hydrocarbon impact. Completion Diagram and Borehole Logs are presented as ***Figure 8***. Initial groundwater sampling of monitoring well MW-6 revealed BTEX concentrations that were non-detect or below WQCC standards and sampling of monitoring well MW-6 was discontinued by Amoco.

During a site visit in 1998 after the XTO acquisition it was discovered that monitoring well MW-4 had been damaged during location equipment upgrades. Monitoring well MW-4 was replaced in June 1998 with monitoring well MW-4R. Monitoring well MW-4R was positioned closer to the production pit excavation. Completion Diagram and Borehole Logs for the replacement monitoring well are presented as ***Figure 9***.

An annual groundwater report for years 1996-1998 was submitted to the OCD in February 1999. It was recommended that monitoring wells MW-4R and MW-5 be sampled on an annual basis until results indicate otherwise. It was also suggested that monitoring well MW-3 be re-sampled annually to verify no further migration from the production pit.

Monitoring wells MW-3 and MW-6 were sampled for BTEX annually through 2000. The samples returned results of non-detect for all BTEX constituents during this sampling period. Monitoring well MW-4R was sampled for BTEX annually through 2002, returning results consistently beneath detection levels for BTEX. Monitoring well MW-5 was sampled annually for BTEX through 2005 with laboratory results showing levels of BTEX exceeding WQCC standards.

The 2005 annual groundwater report was submitted to the OCD in January of 2006 requesting discontinued sampling for BTEX in all monitoring wells except monitoring well MW-5. Annual sampling was proposed in monitoring well MW-5 until the results indicated that an alternative sampling frequency would be warranted.

The 2006 annual groundwater report was submitted to the OCD in February of 2007 proposing continued annual sampling of monitoring well MW-5 until BTEX concentrations in groundwater are below closure standards.

The 2007 annual groundwater report was submitted to the OCD in February of 2008 proposing quarterly sampling of monitoring well MW-5 to monitor decreasing BTEX concentrations.

The 2008 annual groundwater report was submitted to the OCD in April of 2009 proposing quarterly sampling of monitoring well MW-5 to monitor decreasing BTEX concentrations.

The 2009 annual Groundwater Report was submitted to Mr. Glenn Von Gonten with the OCD in March of 2010. The 2009 Annual Groundwater Report proposed the continued quarterly sampling of monitoring well MW-5 until four (4) consecutive quarters returned results below the WQCC standards for all BTEX constituents.

The 2010 annual groundwater report, submitted to Mr. Glenn Von Gonten with the OCD in March of 2011, recommended continued quarterly sampling of groundwater for BTEX constituents in monitoring well MW-5 until WQCC standards have been met for four (4) consecutive quarters. The 2010 annual groundwater report also recommended that hydrogen peroxide be applied to the groundwater aquifer using monitoring well MW-5 as an injection point. This will serve to oxygenate the aquifer and enhance the bio-remediation taking place at this well site.

A summary of water level data and laboratory results from historical and current groundwater monitoring is presented in ***Table 1*** and ***Table 2***. Copies of the laboratory data sheets and associated quality assurance/quality control data for 2011 are presented as ***Attachment 2***.

METHODOLOGY

Quarterly groundwater samples were collected and submitted for laboratory analysis of BTEX in monitoring well MW-5 during 2011.

Water Level Measurements

Static groundwater level monitoring includes recording depth to groundwater measurements with a Keck oil/water interface probe. The interface probe is decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement. These data are recorded as Depth to Water (DTW) and Total Depth (TD) in feet on ***Table 1***.

Groundwater Sampling
Prior to sampling groundwater, depth to groundwater and total depth of wells is measured with a Keck oil/water interface probe. Presence of any free-phase crude oil is also investigated using the interface probe. The interface probe is decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement. The volume of water in the wells is calculated, and a minimum of three casing volumes of water is purged from each well using a disposable bailer or a permanent decontaminated PVC bailer. As water is extracted, pH, electric conductivity and temperature are monitored. Wells are purged until these properties stabilize, indicating that the purge water is representative of aquifer conditions. Stabilization is defined as three consecutive stable readings for each water property (±0.4 units for pH, ±10 percent for electric conductivity and ±2° C for temperature). All purge water is disposed of into tanks on site.

Once each monitoring well is properly purged, groundwater samples are collected by filling at least two 40-millititer (ml) glass vials. The pre-cleaned non-preserved vials are filled and capped with no air inside to prevent degradation of the sample. Samples are labeled with the date and time of collection, well designation, project name, collector's name and parameters to be analyzed. They are immediately sealed and packed on ice. The samples are shipped to Environmental Science Corporation (ESC) based out of Mt. Juliet, Tennessee for analysis. Samples were sealed in a cooler with ice, and shipped via Fed-Ex overnight to ESC for analysis. Proper chain-of-custody (COC) procedures are followed with logs documenting the date and time sampled, sample number, type of sample, sampler's name, preservative used, analyses required and sampler's signature. Field notes from 2011 are included as ***Attachment 3***.

Groundwater Contour Maps
Top of casing well elevations were surveyed using a surveyor's level; and groundwater elevations obtained from monitoring wells during site visits were used to draft groundwater contour maps. Contours were inferred based on groundwater elevations obtained and observation of physical characteristics at the site (topography, proximity to irrigation ditches, etc.).

RESULTS

Laboratory results from monitoring well MW-5 showed increasing concentrations of benzene, ethylbenzene, and total xylenes when compared to concentrations detected in 2010. Concentrations of toluene remained stable. Benzene and total xylenes concentrations exceeded the WQCC standard during the March, June, September, and December 2011 sampling events; toluene and ethylbenzene concentrations did not exceed the WQCC standard during 2011. The maximum concentration of benzene was 620 parts per billion (ppb) in March 2011 and the minimum concentration of benzene was 290 ppb in September 2011. The maximum concentration of total xylenes was 1,700 ppb in March 2011 and the minimum concentration of total xylenes was 680 ppb in September 2011. Groundwater elevations measured in 2011 were consistent when compared to groundwater elevations obtained in 2010.

Field data collected during site monitoring activities indicate a groundwater gradient that is likely influenced by a nearby irrigation ditch located immediately west of the location. In June when the irrigation ditch is running, the groundwater gradient trends to the northeast, in September, the groundwater gradient trends to the south/southeast and the groundwater gradient trends towards the west in March and December due to the

absence of water in the adjacent irrigation ditch. ***Figure 2*** illustrates the estimated groundwater gradients during 2011.

CONCLUSIONS

Based on the laboratory results obtained during 2011, BTEX concentrations are increasing in the groundwater in monitoring well MW-5. The benzene levels increased sharply in March of 2011, but began declining again in the second and third quarter, before rebounding in the fourth quarter; a similar trend was observed in 2010. Xylene concentrations remained above the WQCC standards during 2011, compared to only one quarter (December) in 2010. Xylene concentrations exhibited the same trend as benzene; increasing sharply in March of 2011, declining in the second and third quarter, then rebounding in the fourth quarter.

Historical benzene concentrations in MW-5 were compared to groundwater elevations at the site. The lowest groundwater elevations occur in March and coincide with the highest benzene concentrations. Two possible explanations for the increasing benzene concentrations include the presence of a residual amount of contamination in the vadose zone that diffuses from soil gas into groundwater during the winter when the water table is lower or there is a hysteresis of the water infiltrating from the ditch toward MW-5. The infiltrating water intercepts some residual contamination and causes a subsequent spike in benzene concentrations approximately six months after cessation of the irrigation season.

Groundwater levels fluctuated with the irrigation season in 2011 as they did in 2010. Water levels in 2011 were comparable to water levels in 2010. When comparing all groundwater elevations from all June sampling events, groundwater elevations were steady from June 1996 through June of 2000, declined sharply between June of 2000 and June of 2001, and have been steadily trending upward since the June 2001 sampling event.

RECOMMENDATIONS

Continue quarterly sampling of groundwater for BTEX constituents in monitoring well MW-5 until WQCC standards have been met for four (4) consecutive quarters.

XTO recommends that hydrogen peroxide be applied to the groundwater aquifer using monitoring well MW-5 as an injection point during 2012. This will serve to oxygenate the aquifer and enhance the bio-remediation taking place at this well site. The hydrogen peroxide will be added pursuant to the work plan prepared by LT Environmental, included as ***Attachment 4***.

Following OCD approval for closure, all monitoring well locations will be abandoned in accordance with the monitoring well abandonment plan.

Table 1

Water Level Summary Table

TABLE 3

GROUNDWATER LEVELS AND ELEVATIONS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet - BTOC)	Groundwater Elevation (feet relative to site)
MW-3	6/14/1996	14.39	87.29
MW-3	5/26/1999	15.29	86.39
MW-3	6/30/2000	15.51	86.17
MW-3	6/28/2006	13.81	87.87
MW-3	6/15/2007	13.10	88.58
MW-3	12/26/2007	14.52	87.16
MW-3	3/12/2008	14.35	87.33
MW-3	6/2/2008	12.82	88.86
MW-3	9/22/2008	12.16	89.52
MW-3	12/5/2008	13.30	88.38
MW-3	3/2/2009	14.90	86.78
MW-3	6/10/2009	13.10	88.58
MW-3	9/15/2009	12.28	89.40
MW-3	12/10/2009	12.88	88.80
MW-3	3/15/2010	14.73	86.95
MW-3	6/23/2010	12.62	89.06
MW-3	9/15/2010	11.97	89.71
MW-3	12/13/2010	13.36	88.32
MW-3	3/10/2011	14.82	86.86
MW-3	6/16/2011	12.76	88.92
MW-3	9/13/2011	11.67	90.01
MW-3	12/14/2011	12.86	88.82
MW-4	6/14/1996	13.72	*
MW-4	6/24/1997	14.02	*
MW-4R	6/26/1998	11.52	86.55
MW-4R	5/26/1999	11.28	86.79
MW-4R	6/30/2000	11.69	86.38
MW-4R	5/16/2001	13.07	85.00
MW-4R	9/25/2001	11.81	86.26
MW-4R	12/19/2001	12.66	85.41
MW-4R	2/19/2002	13.97	84.10
MW-4R	6/28/2006	9.87	88.20
MW-4R	6/15/2007	9.02	89.05
MW-4R	12/26/2007	10.69	87.38
MW-4R	3/12/2008	11.10	86.97
MW-4R	6/2/2008	8.94	89.13
MW-4R	9/22/2008	8.28	89.79
MW-4R	12/5/2008	10.08	87.99
MW-4R	3/2/2009	11.84	86.23

TABLE 3

GROUNDWATER LEVELS AND ELEVATIONS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet - BTOC)	Groundwater Elevation (feet relative to site)
MW-4R	6/10/2009	9.33	88.74
MW-4R	9/15/2009	8.52	89.55
MW-4R	12/10/2009	10.59	87.48
MW-4R	3/15/2010	11.67	86.40
MW-4R	6/23/2010	8.88	89.19
MW-4R	9/15/2010	8.35	89.72
MW-4R	12/13/2010	10.33	87.74
MW-4R	3/10/2011	12.06	86.01
MW-4R	6/16/2011	8.90	89.17
MW-4R	9/13/2011	7.75	90.32
MW-4R	12/14/2011	10.07	88.00
MW-5	6/14/1996	10.40	87.25
MW-5	6/24/1997	10.27	87.38
MW-5	6/26/1998	10.34	87.31
MW-5	5/26/1999	10.03	87.62
MW-5	6/30/2000	10.78	86.87
MW-5	5/16/2001	12.52	85.13
MW-5	6/26/2002	10.87	86.78
MW-5	6/30/2003	10.96	86.69
MW-5	6/21/2004	9.85	87.80
MW-5	6/27/2005	9.32	88.33
MW-5	6/28/2006	9.35	88.30
MW-5	6/15/2007	8.51	89.14
MW-5	12/26/2007	10.17	87.48
MW-5	3/12/2008	11.26	86.39
MW-5	6/2/2008	8.38	89.27
MW-5	9/22/2008	7.65	90.00
MW-5	12/5/2008	10.30	87.35
MW-5	3/2/2009	12.14	85.51
MW-5	6/10/2009	8.80	88.85
MW-5	9/15/2009	8.94	88.71
MW-5	12/10/2009	10.92	86.73
MW-5	3/15/2010	11.72	85.93
MW-5	6/23/2010	8.10	89.55
MW-5	9/15/2010	7.80	89.85
MW-5	12/13/2010	10.62	87.03
MW-5	3/10/2011	12.46	85.19
MW-5	6/16/2011	8.39	89.26
MW-5	9/13/2011	7.70	89.95
MW-5	12/14/2011	10.33	87.32

TABLE 3

GROUNDWATER LEVELS AND ELEVATIONS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet - BTOC)	Groundwater Elevation (feet relative to site)
MW-6	6/24/1997	15.55	84.65
MW-6	5/26/1999	15.79	84.41
MW-6	6/30/2000	15.90	84.30
MW-6	6/28/2006	13.59	86.61
MW-6	6/15/2007	12.81	87.39
MW-6	12/26/2007	14.11	86.09
MW-6	3/12/2008	13.29	86.91
MW-6	6/2/2008	11.94	88.26
MW-6	9/22/2008	11.60	88.60
MW-6	12/5/2008	12.55	87.65
MW-6	3/2/2009	13.78	86.42
MW-6	6/10/2009	12.14	88.06
MW-6	9/15/2009	11.67	88.53
MW-6	12/10/2009	12.78	87.42
MW-6	3/15/2010	13.57	86.63
MW-6	6/23/2010	11.77	88.43
MW-6	9/15/2010	11.33	88.87
MW-6	12/13/2010	12.55	87.65
MW-6	3/10/2011	13.72	86.48
MW-6	6/16/2011	11.77	88.43
MW-6	9/13/2011**	11.55	90.19
MW-6	12/14/2011	12.71	89.03

Notes:
BTOC - below top of casing
* Top of Casing elevation data not available; therefore, not possible to calculate groundwater elevation.
** Surface casing repaired; new TOC elevation surveyed 101.74

Table 2

Groundwater Results Summary Table

TABLE 4

GROUNDWATER ANALYTICAL RESULTS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
NMWQCC Groundwater Standard		**10**	**750**	**750**	**620**
MW-3	6/14/1996	ND	ND	ND	ND
MW-3	5/26/1999	ND	NA	NA	NA
MW-3	6/30/2000	ND	ND	ND	ND
MW-4	6/14/1996	**94.3**	2.71	ND	106.4
MW-4	6/24/1997	**44.7**	0.5	0.4	3
MW-4R	6/26/1998	**13.4**	ND	ND	0.6
MW-4R	5/26/1999	**16.4**	0.9	2.1	72.2
MW-4R	6/30/2000	ND	ND	ND	ND
MW-4R	5/16/2001	ND	ND	ND	ND
MW-4R	9/25/2001	ND	ND	ND	ND
MW-4R	12/19/2001	ND	ND	ND	ND
MW-4R	2/19/2002	ND	ND	ND	ND
MW-5	6/14/1996	**25.4**	732	953	**9,070**
MW-5	6/24/1997	**58.8**	2.5	2.8	**6,290**
MW-5	6/26/1998	**1270**	89	41.4	**3,200**
MW-5	5/26/1999	**174**	129	252	**990**
MW-5	6/30/2000	**38**	6.4	**750**	**6,390**
MW-5	5/16/2001	**49**	34	700	**4,480**
MW-5	6/26/2002	**84**	ND	630	**3,460**
MW-5	6/30/2003	**51**	ND	420	**2,600**
MW-5	6/21/2004	**39**	19	490	**1,200**
MW-5	6/27/2005	**18**	44	420	**1,900**
MW-5	6/28/2006	**60**	ND	360	**1,500**
MW-5	6/15/2007	**55**	ND	240	**620**
MW-5	12/26/2007	ND	ND	ND	ND
MW-5	3/12/2008	**28**	3.6	88	290
MW-5	6/2/2008	**61**	4.6	300	**890**
MW-5	9/22/2008	**10**	ND	97	260
MW-5	12/5/2008	**32**	4.8	170	410

TABLE 4

GROUNDWATER ANALYTICAL RESULTS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
NMWQCC Groundwater Standard		**10**	**750**	**750**	**620**
MW-5	3/2/2009	**180**	7.8	480	**1,400**
MW-5	6/10/2009	**120**	ND	240	590
MW-5	9/15/2009	**32**	< 5.0	160	380
MW-5	12/10/2009	**45**	< 5.0	58	110
MW-5	3/15/2010	**340**	< 5.0	48	110
MW-5	6/23/2010	**270**	13	130	350
MW-5	9/15/2010	**120**	<25	130	370
MW-5	12/13/2010	**270**	12	230	**630**
MW-5	3/10/2011	**620**	<50	600	**1,700**
MW-5	6/16/2011	**300**	<250	300	**820**
MW-5	9/13/2011	**290**	<25	240	**680**
MW-5	12/14/2011	**500**	6.6	420	**1,000**
MW-6	6/24/1997	ND	0.6	0.5	5.4
MW-6	6/30/2000	ND	ND	ND	ND

Notes:
ug/L - micrograms per liter
NMWQCC - New Mexico Water Quality Control Commission
ND - not detected
BOLD indicates value excees the NMWQCC standard
< - indicates the result was less than the laboratory detection limit

Figure 1

Topographic Map

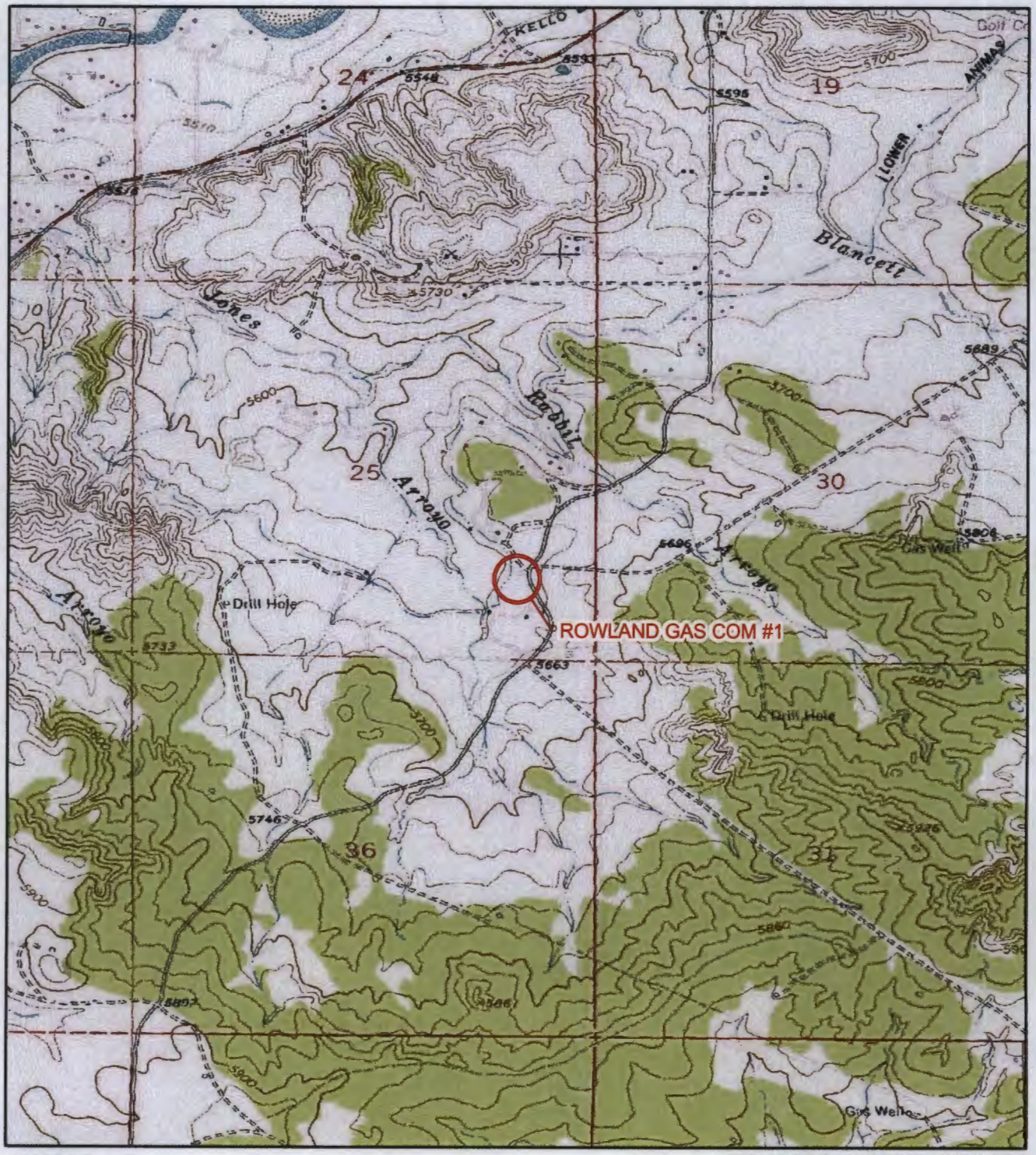


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

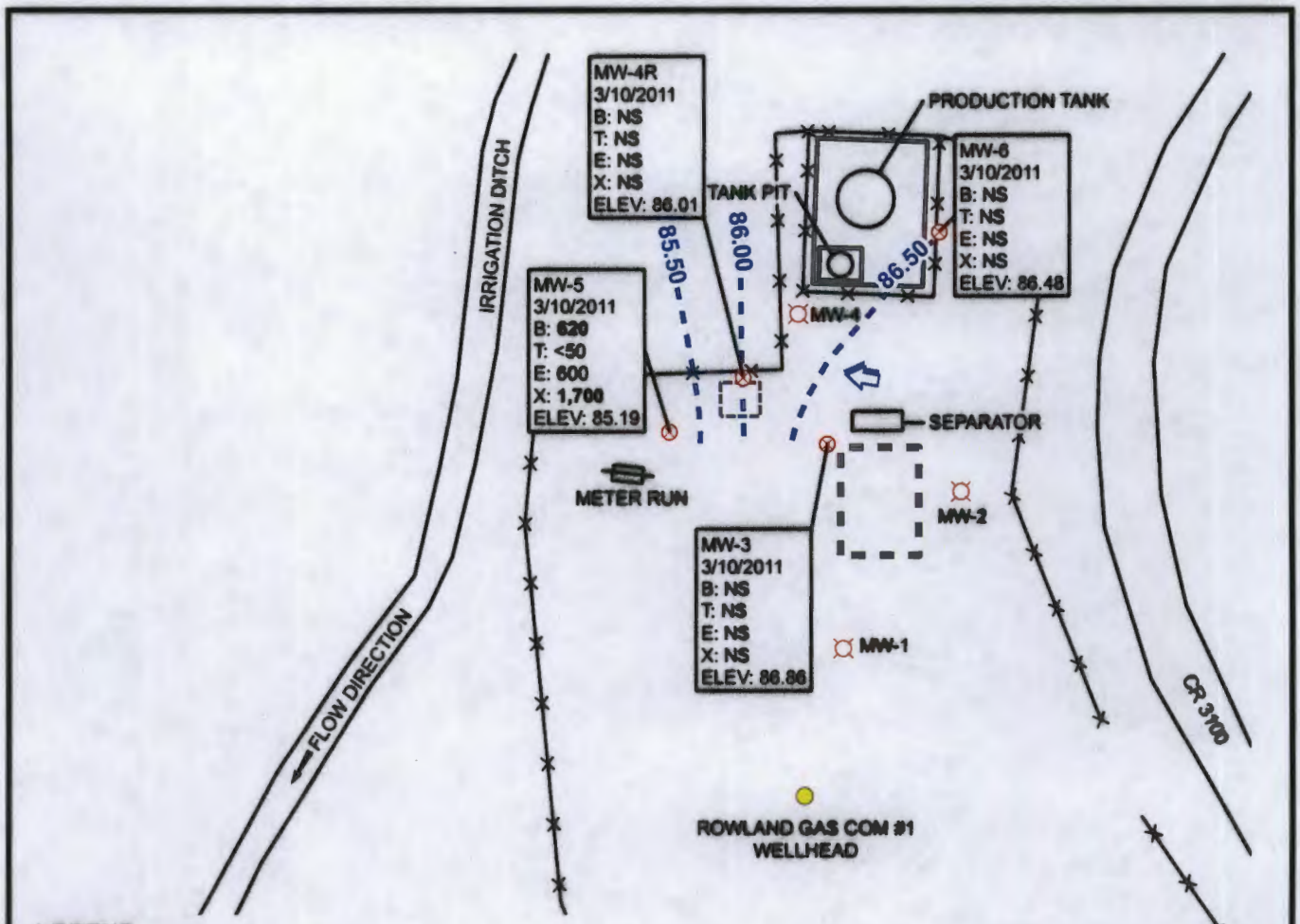
N

FIGURE 1
SITE LOCATION MAP
ROWLAND GAS COM #1
SESE SEC 25 T30N R12W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\XTO1002\XTO1002_ROWLAND_FIG01_SL.mxd

Figure 2

Potentiometric Surface Diagrams



LEGEND

- MONITORING WELL
- DESTROYED MONITORING WELL
- WELLHEAD
- ESTIMATED GROUNDWATER FLOW DIRECTION
- INFERRED RELATIVE GROUNDWATER ELEVATION CONTOUR
- CONTOUR INTERVAL = 0.50 FEET
- FORMER SEPARATOR PIT EXCAVATION
- FORMER PRODUCT TANK PIT EXCAVATION
- BERM
- FENCE

NOTE: MONITORING WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

SAMPLE ID
SAMPLE DATE
B: BENZENE IN MICROGRAMS PER LITER (µg/L)
T: TOLUENE (µg/L)
E: ETHYLBENZENE (µg/L)
X: TOTAL XYLENES (µg/L)
ELEV: RELATIVE GROUNDWATER ELEVATION MEASURED IN FEET
<: LESS THAN LABORATORY METHOD DETECTION LIMIT
NS: NOT SAMPLED
BOLD INDICATES RESULT EXCEEDS THE NEW MEXICO WATER QUALITY CONTROL COMMISSION STANDARD

0 80 160
Feet

N

FIGURE 1
GROUNDWATER ELEVATION
AND ANALYTICAL RESULTS
ROWLAND GAS COM #1
SESE SEC 25 T30N R12W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\XTO 1002\XTO1002_ROWLAND_FIG01_GWELEV_GWANALY_2011_Q1.mxd

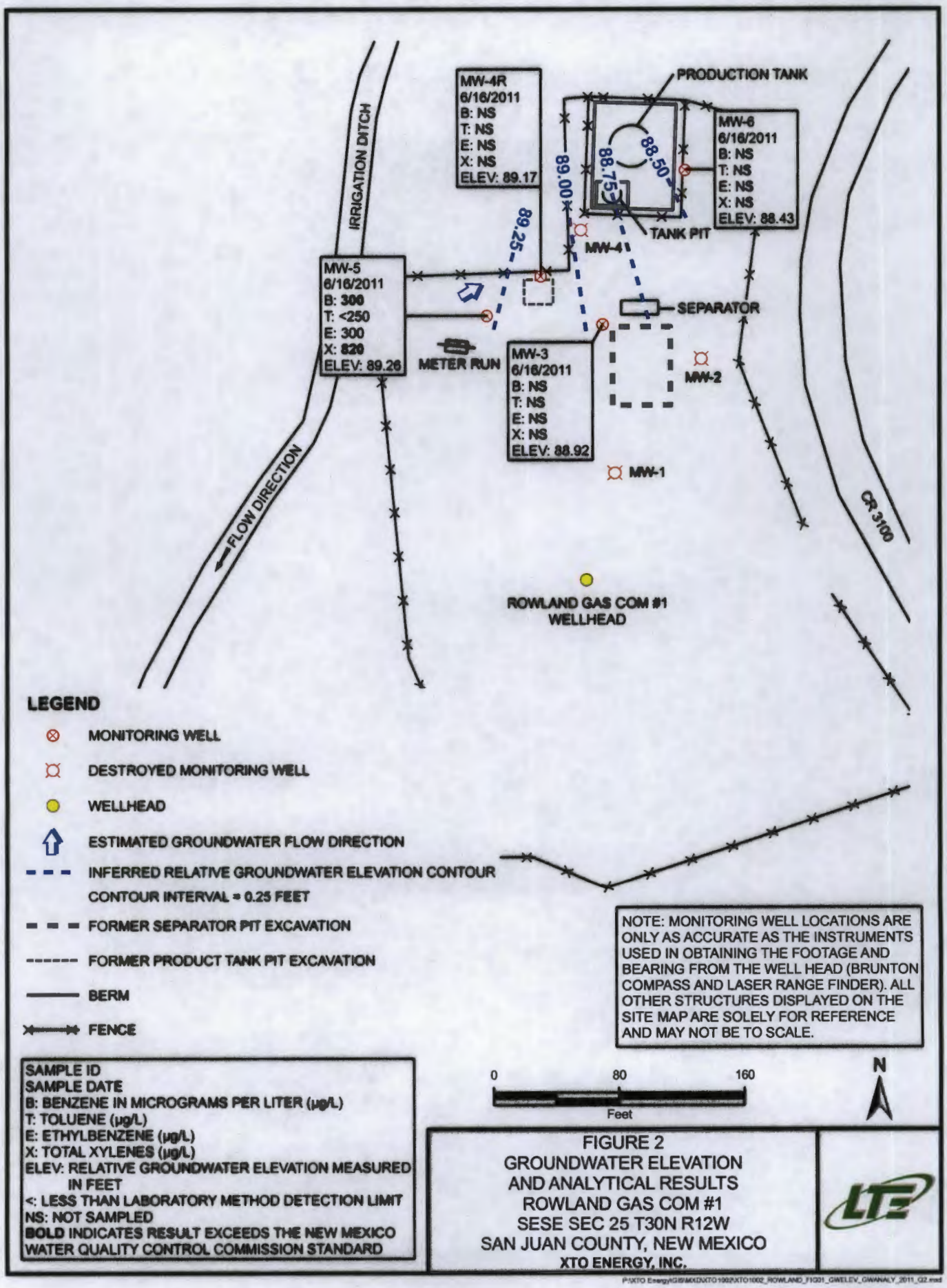


FIGURE 2
GROUNDWATER ELEVATION
AND ANALYTICAL RESULTS
ROWLAND GAS COM #1
SESE SEC 25 T30N R12W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\XTO1002\XTO1002_ROWLAND_F1Q31_GWELEV_GWANALY_2011_Q2.mxd

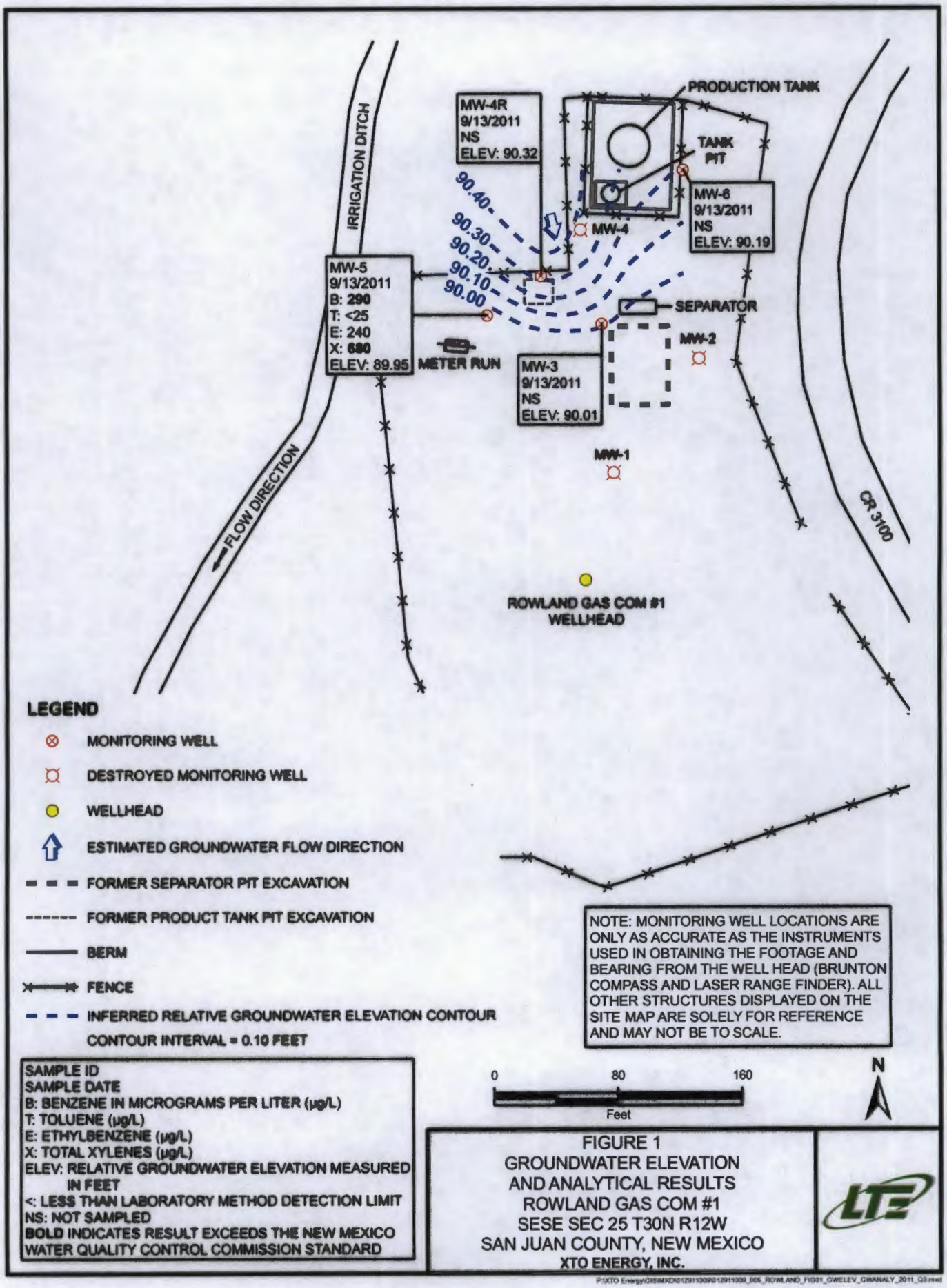


FIGURE 1
GROUNDWATER ELEVATION
AND ANALYTICAL RESULTS
ROWLAND GAS COM #1
SESE SEC 25 T30N R12W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.

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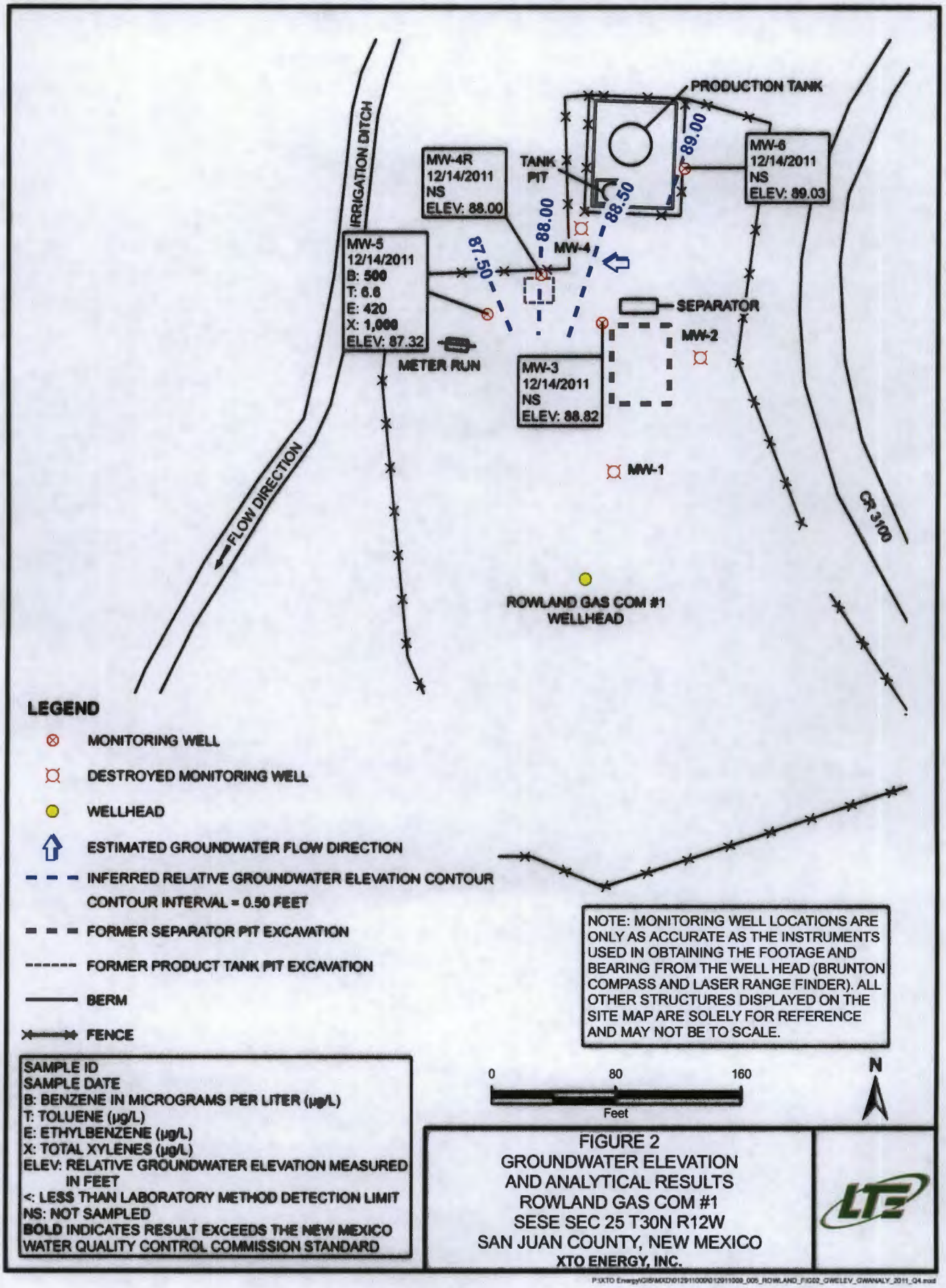


FIGURE 2
GROUNDWATER ELEVATION
AND ANALYTICAL RESULTS
ROWLAND GAS COM #1
SESE SEC 25 T30N R12W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012911000\012911009_005_ROWLAND_FIG02_GWELEV_GWANALY_2011_Q4.mxd

Figure 3-9

Completion Diagrams
And
Borehole Logs

Attachment 1

Envirotech Pit Closure Report (1993)

ENVIROTECH Inc.

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

C4923
94923

FIELD REPORT: CLOSURE VERIFICATION

JOB No: 92110
PAGE No: 1 of 1

LOCATION: LEASE: ROLAND WELL: 6C 1 QD:
SEC: 25 TWP: 30N RNG: 12W BM: NM CNTY: SAN JUAN ST: NM PIT: PROD
CONTRACTOR: BILL MOSS
EQUIPMENT USED: TRACKHOE

DATE STARTED: 8/2/93
DATE FINISHED: 8/2/93

ENVIRONMENTAL SPECIALIST: NV

SOIL REMEDIATION: QUANTITY: 16 X 15 X 13
DISPOSAL FACILITY: CROUCH MESA COMPOST
LAND USE: RANGE & RESIDENTIAL
SURFACE CONDITIONS: UNKNOWN

FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY 60 YARDS N10°W FROM WELLHEAD.

DEPTH TO GROUNDWATER: 13'
NEAREST WATER SOURCE: <750 FT.
NEAREST SURFACE WATER: <100 FT.

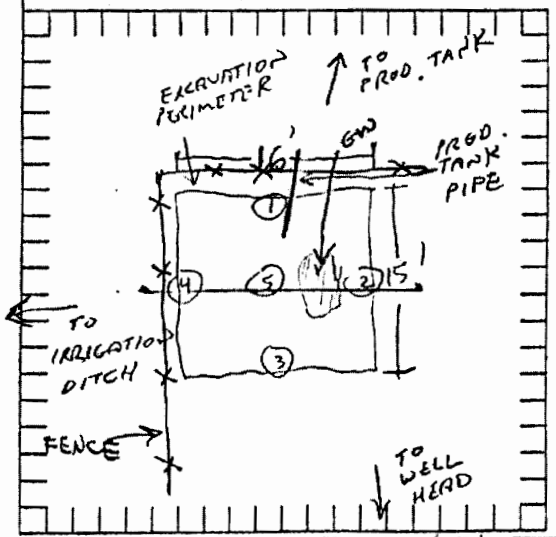
DK. YELLOWISH BROWN TO MEDIUM DK. GRAY SAND, NON-COHESIVE, SLIGHTLY MOIST, LOOSE TO STIFF, AND STRONG ODOR ON ALL BUT ④ @ 9'. GROUNDWATER CONTAINED A SLIGHT SHEEN ON ITS SURFACE.

FIELD 418.1 CALCULATIONS

SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm

SCALE
0 FEET

PIT PERIMETER

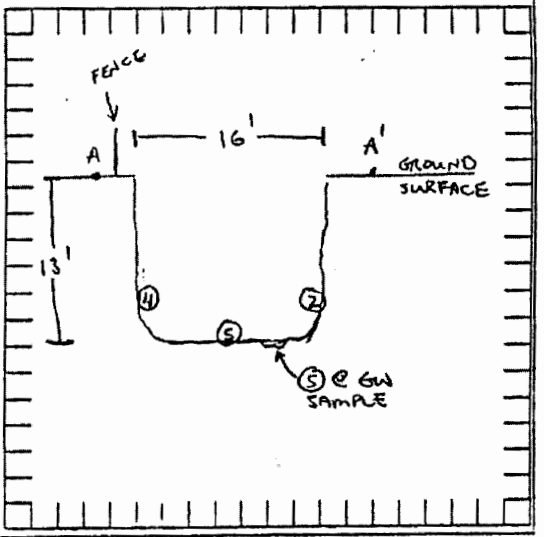


OVM RESULTS

SAMPLE ID	FIELD HEADSPACE PID (ppm)
① @ 9'	1511
② @ 9'	1403
③ @ 9'	1675
④ @ 9'	20.6
⑤ @ 13'	1654
⑤ @ GW (13')	
BTEX SAMPLE	

2080

PIT PROFILE



TRAVEL NOTES: CALLOUT: 7/30/93 ONSITE: 8/2/93

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	5 @ GW (13')	Date Reported:	08-04-93
Laboratory Number:	5816	Date Sampled:	08-02-93
Sample Matrix:	Water	Date Received:	08-02-93
Preservative:	HgCl & Cool	Date Analyzed:	08-03-93
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	183	0.2
Toluene	1.1	0.4
Ethylbenzene	0.3	0.2
p,m-Xylene	2.1	0.4
o-Xylene	32.3	0.3

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	93 %
Bromofluorobenzene	87 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Roland GC #1 Production Pit C4923

Analyst

Review

2880

CHAIN OF CUSTODY RECORD

C4925

Client/Project Name	Project Location	ANALYSIS/PARAMETERS
Amoco 92140	PROD. PIT ROLAND GC #1	
Sampler: (Signature) Nelson Velez	Chain of Custody Tape No.	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8020)						Remarks
(5) #2 GW (13')	8/2/93	1040	5816	WATER	2	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	8/2/93	1555	Kevin L. Flanders	8-2-93	1555
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

san juan repro Form 578-81

Attachment 2

2011 Laboratory Reports

ESC
L·A·B S·C·I·E·N·C·E·S
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Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

Report Summary

Tuesday March 15, 2011

Report Number: L505863
Samples Received: 03/11/11
Client Project:

Description: Rowland GC 1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Daphne R Richards
Daphne Richards , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002,NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

March 15, 2011

ESC Sample # : L505863-01

Site ID : ROWLAND GC1

Project # :

Date Received : March 11, 2011
Description : Rowland GC 1

Sample ID : ROWLAND MW-5

Collected By : Brooke Herb
Collection Date : 03/10/11 12:40

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.62	0.0050	mg/l	8021B	03/12/11	10
Toluene	BDL	0.050	mg/l	8021B	03/12/11	10
Ethylbenzene	0.60	0.0050	mg/l	8021B	03/12/11	10
Total Xylene	1.7	0.015	mg/l	8021B	03/12/11	10
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	99.1		% Rec.	8021B	03/12/11	10

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 03/15/11 16:15 Printed: 03/15/11 16:16

Summary of Remarks For Samples Printed
03/15/11 at 16:16:15

TSR Signing Reports: 288
R5 - Desired TAT

drywt

Sample: L505863-01 Account: XTORNM Received: 03/11/11 08:30 Due Date: 03/18/11 00:00 RPT Date: 03/15/11 16:15

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XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L505863

March 15, 2011

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG525601	03/11/11 17:31
Ethylbenzene	< .0005	mg/l			WG525601	03/11/11 17:31
Toluene	< .005	mg/l			WG525601	03/11/11 17:31
Total Xylene	< .0015	mg/l			WG525601	03/11/11 17:31
a,a,a-Trifluorotoluene(PID)		% Rec.	96.83	55-122	WG525601	03/11/11 17:31

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0497	99.4	79-114	WG525601
Ethylbenzene	mg/l	.05	0.0479	95.9	80-116	WG525601
Toluene	mg/l	.05	0.0477	95.3	79-112	WG525601
Total Xylene	mg/l	.15	0.143	95.2	84-118	WG525601
a,a,a-Trifluorotoluene(PID)				98.55	55-122	WG525601

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0489	0.0497	98.0	79-114	1.57	20	WG525601
Ethylbenzene	mg/l	0.0470	0.0479	94.0	80-116	2.05	20	WG525601
Toluene	mg/l	0.0471	0.0477	94.0	79-112	1.10	20	WG525601
Total Xylene	mg/l	0.140	0.143	94.0	84-118	1.80	20	WG525601
a,a,a-Trifluorotoluene(PID)				98.67	55-122			WG525601

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0533	0	.05	107.	35-147	L505845-06	WG525601
Ethylbenzene	mg/l	0.0518	0	.05	104.	39-141	L505845-06	WG525601
Toluene	mg/l	0.0501	0	.05	100.	35-148	L505845-06	WG525601
Total Xylene	mg/l	0.157	0	.15	105.	33-151	L505845-06	WG525601
a,a,a-Trifluorotoluene(PID)					98.83	55-122		WG525601

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0520	0.0533	104.	35-147	2.49	20	L505845-06	WG525601
Ethylbenzene	mg/l	0.0501	0.0518	100.	39-141	3.48	20	L505845-06	WG525601
Toluene	mg/l	0.0500	0.0501	100.	35-148	0.300	20	L505845-06	WG525601
Total Xylene	mg/l	0.151	0.157	101.	33-151	3.90	20	L505845-06	WG525601
a,a,a-Trifluorotoluene(PID)				99.71	55-122				WG525601

Batch number /Run number / Sample number cross reference

WG525601: R1611749: L505863-01

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Tax I.D. 62-0814289

Est. 1970

XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L505863

March 15, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

* ONLY 1 COC PER SITE *

C129

Chain of Custody
Page 1 of 1

Company Name/Address	Alternate Billing	Analysis/Container/Preservative
XTO Energy, Inc. **382 County Road 3100** **Aztec, NM 87410**	~~XTORNM031810S~~ XTORNM0819105 Report to: James McDaniel E-mail to: James_McDaniel@xtoenergy.com	BTEX (8021)

Prepared by:

ENVIRONMENTAL
Science corp
12065 Lebanon Road
Mt. Juliet TN 37122
Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

Project Description: (Well Name) ROWLAND GC #1		City/State Collected: AZTEC, NM	
PHONE: 505-333-3701 FAX:	Client Project No.	Lab Project #	
Collected by: ~~James McDaniel~~ Brooke Herb	Site/Facility ID# (well name) Rowland GC#1	P.O.#	
Collected by(signature):	Rush? (Lab MUST be Notified) _____Next Day.....100% _____Two Day.....50% _____Three Day.....25%	Date Results Needed Email? ___No_X__Yes FAX? ___No___Yes	No of Cntrs
Packed on Ice N___ Y_X_			

CoCode (lab use only)
XTORNM
Template/Prelogin
Shipped Via: Fed Ex

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	BTEX (8021)	Remarks/contaminant	Sample # (lab only)
ROWLAND MW-5	GRAB	GW	N/A	3/10/11	12:40	3	X	NON Preserved	L50586301

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Remarks:

Flow_____ Other_____

Relinquisher by:(Signature)	Date: 3/10/11	Time: 1500	Received by:(Signature)	Samples returned via: FedEx_X_ UPS__Other__ 434198156095	Condition (lab use only) COOL	
Relinquisher by:(Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.7°	Bottles Received: 3 ✓	
Relinquisher by:(Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/10/11	Time: 08:30	pH Checked: NCF:

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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

James McDaniel
XTO Energy - San Juan Division
382 County Road 3100
Aztec, NM 87410

Report Summary

Sunday June 19, 2011

Report Number: L521665
Samples Received: 06/17/11
Client Project:

Description: Rowland

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Daphne R Richards
Daphne Richards , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002,NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

James McDaniel
XTO Energy - San Juan Division
382 County Road 3100
Aztec, NM 87410

June 19, 2011

ESC Sample # : L521665-01

Date Received : June 17, 2011
Description : Rowland

Site ID : ROWLAND

Sample ID : MW-5

Project # :

Collected By : Julie Linn
Collection Date : 06/16/11 13:52

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.30	0.025	mg/l	8021B	06/19/11	50
Toluene	BDL	0.25	mg/l	8021B	06/19/11	50
Ethylbenzene	0.30	0.025	mg/l	8021B	06/19/11	50
Total Xylene	0.82	0.075	mg/l	8021B	06/19/11	50
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021B	06/19/11	50

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/19/11 14:41 Printed: 06/19/11 14:42

Summary of Remarks For Samples Printed
06/19/11 at 14:42:17

TSR Signing Reports: 288
R5 - Desired TAT

Sample: L521665-01 Account: XTORNM Received: 06/17/11 09:00 Due Date: 06/24/11 00:00 RPT Date: 06/19/11 14:41
No Pres.

ESC
L·A·B S·C·I·E·N·C·E·S
YOUR LAB OF CHOICE

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Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

XTO Energy - San Juan Division
James McDaniel
382 County Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L521665

June 19, 2011

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG541255	06/18/11 20:29
Ethylbenzene	< .0005	mg/l			WG541255	06/18/11 20:29
Toluene	< .005	mg/l			WG541255	06/18/11 20:29
Total Xylene	< .0015	mg/l			WG541255	06/18/11 20:29
a,a,a-Trifluorotoluene(PID)		% Rec.	103.2	55-122	WG541255	06/18/11 20:29

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0491	98.2	79-114	WG541255
Ethylbenzene	mg/l	.05	0.0479	95.8	80-116	WG541255
Toluene	mg/l	.05	0.0478	95.6	79-112	WG541255
Total Xylene	mg/l	.15	0.146	97.4	84-118	WG541255
a,a,a-Trifluorotoluene(PID)				102.6	55-122	WG541255

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0468	0.0491	94.0	79-114	4.79	20	WG541255
Ethylbenzene	mg/l	0.0456	0.0479	91.0	80-116	4.99	20	WG541255
Toluene	mg/l	0.0455	0.0478	91.0	79-112	5.02	20	WG541255
Total Xylene	mg/l	0.139	0.146	93.0	84-118	4.94	20	WG541255
a,a,a-Trifluorotoluene(PID)				102.8	55-122			WG541255

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0457	0	.05	91.5	35-147	L521510-01	WG541255
Ethylbenzene	mg/l	0.0436	0	.05	87.2	39-141	L521510-01	WG541255
Toluene	mg/l	0.0441	0	.05	88.1	35-148	L521510-01	WG541255
Total Xylene	mg/l	0.133	0	.15	88.8	33-151	L521510-01	WG541255
a,a,a-Trifluorotoluene(PID)					102.8	55-122		WG541255

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0444	0.0457	88.8	35-147	3.00	20	L521510-01	WG541255
Ethylbenzene	mg/l	0.0424	0.0436	84.7	39-141	2.86	20	L521510-01	WG541255
Toluene	mg/l	0.0431	0.0441	86.1	35-148	2.30	20	L521510-01	WG541255
Total Xylene	mg/l	0.130	0.133	86.6	33-151	2.45	20	L521510-01	WG541255
a,a,a-Trifluorotoluene(PID)				102.3	55-122				WG541255

Batch number /Run number / Sample number cross reference

WG541255: R1728870: L521665-01

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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XTO Energy - San Juan Division
James McDaniel
382 County Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L521665

June 19, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Company Name/Address

XTO Energy, Inc.

382 County Road 3100
Aztec, NM 87410

Alternate Billing

XTORNM031810S

Report to: James McDaniel

E-mail to: james_mcdaniel@xtoenergy.com

Analysis/Container/Preservative

BTEX, 8021 (Non-preserved)

Chain of Custody
Page 1 of 1

Prepared by: A165

ENVIRONMENTAL Science corp
12065 Lebanon Road
Mt. Juliet TN 37122
Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

Project Description: Rowland

City/State Collected: Bloomfield, NM

PHONE: 505-333-3701

FAX:

Client Project No.

Lab Project #

Collected by: Julie Linn

Site/Facility ID# Rowland

P.O.#

Collected by(signature): Julie L

Packed on Ice N__ Y_X

Rush? (Lab MUST be Notified)
_____Next Day.....100%
_____Two Day.....50%
_____Three Day.....25%

Date Results Needed

Email?___No_X__Yes
FAX?___No__Yes

No of Cntrs

CoCode (lab use only)

XTORNM

Template/Prelogin

Shipped Via: Fed Ex

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	Remarks/contaminant	Sample # (lab only)
MW-5	Grab	GW	N/A	6-16-11	1352	3		L524665-01

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH_____ Temp_____

Remarks: "ONLY 1 COC Per Site!!"

Flow_____ Other_____

Relinquisher by:(Signature	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx_X_ UPS__Other__	Condition (lab use only)
Julie L	6-16-11	1445			OK
Relinquisher by:(Signature	Date:	Time:	Received by: (Signature)	Temp: 3.1c / Bottles Received: 3V	
Relinquisher by:(Signature	Date:	Time:	Received for lab by:(Signature)	Date: 6/17/11 / Time: 0900	pH Checked: NCF:

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Est. 1970

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

Report Summary

Wednesday September 21, 2011

Report Number: L535938
Samples Received: 09/14/11
Client Project: ROWLAND GC #1

Description: Rowland GC #1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Daphne R Richards
Daphne Richards , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002,NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

September 21, 2011

ESC Sample # : L535938-01

Date Received : September 14, 2011
Description : Rowland GC #1

Site ID : ROWLAND GC #1

Sample ID : MW-5

Project # : ROWLAND GC #1

Collected By : Sam LaRue
Collection Date : 09/13/11 11:47

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.29	0.0025	mg/l	8021B	09/20/11	5
Toluene	BDL	0.025	mg/l	8021B	09/20/11	5
Ethylbenzene	0.24	0.0025	mg/l	8021B	09/20/11	5
Total Xylene	0.68	0.0075	mg/l	8021B	09/20/11	5
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	99.5		% Rec.	8021B	09/20/11	5

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 09/21/11 10:33 Printed: 09/21/11 10:33

Summary of Remarks For Samples Printed
09/21/11 at 10:33:39

TSR Signing Reports: 288
R5 - Desired TAT

drywt

Sample: L535938-01 Account: XTORNM Received: 09/14/11 09:00 Due Date: 09/21/11 00:00 RPT Date: 09/21/11 10:33
Non Preserved

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Tax I.D. 62-0814289

Est. 1970

XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L535938

September 21, 2011

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG556159	09/20/11 13:51
Ethylbenzene	< .0005	mg/l			WG556159	09/20/11 13:51
Toluene	< .005	mg/l			WG556159	09/20/11 13:51
Total Xylene	< .0015	mg/l			WG556159	09/20/11 13:51
a,a,a-Trifluorotoluene(PID)		% Rec.	101.2	55-122	WG556159	09/20/11 13:51

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0451	90.3	79-114	WG556159
Ethylbenzene	mg/l	.05	0.0508	102.	80-116	WG556159
Toluene	mg/l	.05	0.0503	101.	79-112	WG556159
Total Xylene	mg/l	.15	0.148	98.3	84-118	WG556159
a,a,a-Trifluorotoluene(PID)				100.6	55-122	WG556159

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0453	0.0451	91.0	79-114	0.500	20	WG556159
Ethylbenzene	mg/l	0.0505	0.0508	101.	80-116	0.740	20	WG556159
Toluene	mg/l	0.0506	0.0503	101.	79-112	0.560	20	WG556159
Total Xylene	mg/l	0.149	0.148	99.0	84-118	0.900	20	WG556159
a,a,a-Trifluorotoluene(PID)				101.3	55-122			WG556159

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0465	0	.05	92.9	35-147	L536219-04	WG556159
Ethylbenzene	mg/l	0.0527	0	.05	105.	39-141	L536219-04	WG556159
Toluene	mg/l	0.0521	0	.05	104.	35-148	L536219-04	WG556159
Total Xylene	mg/l	0.154	0	.15	102.	33-151	L536219-04	WG556159
a,a,a-Trifluorotoluene(PID)					99.97	55-122		WG556159

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0466	0.0465	93.2	35-147	0.270	20	L536219-04	WG556159
Ethylbenzene	mg/l	0.0518	0.0527	104.	39-141	1.71	20	L536219-04	WG556159
Toluene	mg/l	0.0521	0.0521	104.	35-148	0.0400	20	L536219-04	WG556159
Total Xylene	mg/l	0.152	0.154	101.	33-151	1.27	20	L536219-04	WG556159
a,a,a-Trifluorotoluene(PID)				99.86	55-122				WG556159

Batch number /Run number / Sample number cross reference

WG556159: R1866153: L535938-01

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L535938

September 21, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Company Name/Address

XTO Energy, Inc.

382 County Road 3100
Aztec, NM 87410

Alternate Billing

XTORNM031810S

Report to: James McDaniel

E-mail to: james_mcdaniel@xtoenergy.com

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1

Prepared by:

ENVIRONMENTAL
Science corp

12065 Lebanon Road

Mt. Juliet TN 37122

Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

Project Description: Rowland GC #1

City/State Collected: Bloomfield, NM

PHONE: 505-333-3701

FAX:

Client Project No. Rowland GC#1

Lab Project #

Collected by: Sam LaRue

Site/Facility ID# Rowland GC#1

P.O.#

Collected by(signature):

Packed on Ice N___ Y_X_

Rush? (Lab MUST be Notified)
_____Next Day.....100%
_____Two Day.....50%
_____Three Day.....25%

Date Results Needed

Email?___No_X__Yes
FAX?___No___Yes

CoCode (lab use only)

XTORNM

Template/Prelogin B069

Shipped Via: Fed Ex

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cntrs	BTEX (8021 B) NON-Preserved	Remarks/contaminant	Sample # (lab only)
MW-5	Grab	GW	N/A	9/13/11	11:47	3	X	Non-Preserved	L535938-01

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

4311 9/14 2:00 pH_____ Temp_____

Remarks: "ONLY 1 COC Per Site!!"

Flow_____ Other_____

Relinquished by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx_X_ UPS__Other__	Condition (lab use only)
	9/13/11	14:52			OK
Relinquished by:(Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.4°	Bottles Received: 3-V
Relinquished by:(Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9-14-11	Time: 09:00
				pH Checked:	NCF:

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Est. 1970

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

Report Summary

Tuesday December 20, 2011

Report Number: L551708
Samples Received: 12/15/11
Client Project:

Description: Rowland Gas Com #1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Daphne R Richards

Daphne Richards , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002,NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915, PA - 68-02979

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

December 20, 2011

ESC Sample # : L551708-01

Site ID : ROWLAND GAS COM 1

Project # :

Date Received : December 15, 2011
Description : Rowland Gas Com #1

Sample ID : MW-5

Collected By : Devin Hencwann
Collection Date : 12/14/11 13:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.50	0.0050	mg/l	8021B	12/16/11	10
Toluene	0.0066	0.0050	mg/l	8021B	12/16/11	1
Ethylbenzene	0.42	0.0050	mg/l	8021B	12/16/11	10
Total Xylene	1.0	0.015	mg/l	8021B	12/16/11	10
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	111.		% Rec.	8021B	12/16/11	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 12/20/11 10:55 Printed: 12/20/11 10:56

Summary of Remarks For Samples Printed
12/20/11 at 10:56:10

TSR Signing Reports: 288
R5 - Desired TAT

drywt

Sample: L551708-01 Account: XTORNM Received: 12/15/11 09:00 Due Date: 12/22/11 00:00 RPT Date: 12/20/11 10:55

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XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L551708

December 20, 2011

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Toluene	< .005	mg/l			WG570206	12/15/11 19:55
a,a,a-Trifluorotoluene(PID)		% Rec.	97.52	55-122	WG570206	12/15/11 19:55
Benzene	< .0005	mg/l			WG570394	12/16/11 16:09
Ethylbenzene	< .0005	mg/l			WG570394	12/16/11 16:09
Total Xylene	< .0015	mg/l			WG570394	12/16/11 16:09
a,a,a-Trifluorotoluene(PID)		% Rec.	99.03	55-122	WG570394	12/16/11 16:09

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Toluene	mg/l	.05	0.0465	93.0	79-112	WG570206
a,a,a-Trifluorotoluene(PID)				98.08	55-122	WG570206
Benzene	mg/l	.05	0.0463	92.6	79-114	WG570394
Ethylbenzene	mg/l	.05	0.0503	101.	80-116	WG570394
Total Xylene	mg/l	.15	0.147	97.8	84-118	WG570394
a,a,a-Trifluorotoluene(PID)				98.69	55-122	WG570394

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Toluene	mg/l	0.0539	0.0465	108.	79-112	14.8	20	WG570206
a,a,a-Trifluorotoluene(PID)				90.71	55-122			WG570206
Benzene	mg/l	0.0477	0.0463	95.0	79-114	2.90	20	WG570394
Ethylbenzene	mg/l	0.0520	0.0503	104.	80-116	3.30	20	WG570394
Total Xylene	mg/l	0.150	0.147	100.	84-118	2.55	20	WG570394
a,a,a-Trifluorotoluene(PID)				99.96	55-122			WG570394

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Toluene	mg/l	0.0447	0	.05	89.4	35-148	L551720-01	WG570206
a,a,a-Trifluorotoluene(PID)					97.93	55-122		WG570206
Benzene	mg/l	0.994	0.530	.05	92.8	35-147	L551485-03	WG570394
Ethylbenzene	mg/l	0.663	0.140	.05	105.	39-141	L551485-03	WG570394
Total Xylene	mg/l	1.74	0.200	.15	103.	33-151	L551485-03	WG570394
a,a,a-Trifluorotoluene(PID)					98.32	55-122		WG570394

Matrix Spike Duplicate

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Toluene	mg/l	0.0430	0.0447	85.9	35-148	4.01	20	L551720-01	WG570206
a,a,a-Trifluorotoluene(PID)				98.95	55-122				WG570206
Benzene	mg/l	0.996	0.994	93.3	35-147	0.250	20	L551485-03	WG570394
Ethylbenzene	mg/l	0.653	0.663	102.	39-141	1.63	20	L551485-03	WG570394
Total Xylene	mg/l	1.71	1.74	101.	33-151	1.73	20	L551485-03	WG570394
a,a,a-Trifluorotoluene(PID)				98.89	55-122				WG570394

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L551708

December 20, 2011

Batch number /Run number / Sample number cross reference

WG570206: R1969214: L551708-01
WG570394: R1972775: L551708-01

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L551708

December 20, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

D080

Company Name/Address	Alternate Billing	Analysis/Container/Preservative	Chain of Custody Page 1 of 1
XTO Energy, Inc. **382 County Road 3100** **Aztec, NM 87410**	XTORNM031810S Report to: James McDaniel E-mail to: james_mcdaniel@xtoenergy.com	BTEX 8021	Prepared by: ENVIRONMENTAL Science corp 12065 Lebanon Road Mt. Juliet TN 37122 Phone (615)758-5858 Phone (800) 767-5859 FAX (615)758-5859

Project Description: Rowland Gas Com #1	City/State Collected: Bloomfield, NM		
PHONE: 505-333-3701 FAX:	Client Project No.	Lab Project #	CoCode (lab use only) XTORNM Template/Prelogin
Collected by: Devin Hencmon	Site/Facility ID# Rowland Gas Com #1	P.O.#	Shipped Via: Fed Ex
Collected by(signature):	Rush? (Lab MUST be Notified) _____Next Day.....100% _____Two Day.....50% _____Three Day.....25%	Date Results Needed Email? No X Yes FAX? No Yes	No of Cntrs
Packed on Ice N Y X			

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time		Remarks/contaminant	Sample # (lab only)
MW-5	Grab	GW	NA	12/14/11	1335	3 X		L551708-01

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____ pH_____ Temp_____

Remarks: "ONLY 1 COC Per Site!!" Flow_____ Other_____

4341 9819 2120

Relinquisher by:(Signature	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx X UPS Other	Condition (lab use only)
	12/14/11	1500			OK
Relinquisher by:(Signature	Date:	Time:	Received by: (Signature)	Temp: 2.8°C / Bottles Received: 3V	
Relinquisher by:(Signature	Date:	Time:	Received for lab by: (Signature)	Date: 12/15/11 / Time: 0900	pH Checked: NCF:

Attachment 3

Field Notes

SAMPLING PURGE LOG

Project Name: XTO GW Monitoring | Location: Rowland | Well No: MW-5
Client: XTO Energy | Date: 3/10/2011 | Time: 12:09
Project Manager: Julie Linn | Sampler's Name: Brooke Herb

Measuring Point: TOC | Depth to Water: 12.46 ft | Depth to Product: NA ft
Well Diameter: 2" | Total Depth: 15.18 ft | Product Thickness: NA ft
Water Column Height: 2.72 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☐ Other

Water Volume in Well			
Gallons of water per foot	Feet of water in well	Gallons of water in well	3 casing volumes to be removed
0.1631	2.72	0.443632	1.33

Time (military)	pH (su)	EC (ms)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. Gallons	Comments/Flow Rate
12:15	6.83	3.68	13.0				0.25	black, strong HC odor
12:17	6.92	3.65	12.4				0.4	no change
12:18	7.03	3.57	12.8				0.5	bail down, black strong HC odor, minor silt
12:23	7.14	3.60	13.2				0.65	bailed dry; wait
12:28	7.12	3.85	13.7				0.85	no comments
12:30	7.10	3.94	13.5				1	lighter gray, more silt
12:32	7.12	3.98	13.4				1.15	stronger HC odor
12:34	7.16	3.95	13.4				1.25	no change
12:36	7.16	3.99	13.4				1.35	no change
Final:	7.16	3.99	13.4				1.35	

COMMENTS:

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: On site sump

Sample ID: Rowland MW-5 Sample Time: 12:40

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: No Duplicate Sample: No

SAMPLING PURGE LOG

Project Name: XTO Groundwater | Location: Rowland GC #1 | Well No: MW-5
Client: XTO Energy, Inc. | Date: 6/16/2011 | Time: 13:26
Project Manager: Julie Linn | Sampler's Name: J. Linn

Measuring Point: TOC | Depth to Water: 8.39 ft | Depth to Product: NA ft
Well Diameter: 2" | Total Depth: 14.86 ft | Product Thickness: NA ft
Water Column Height: 6.47 ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☐ Other

Water Volume in Well			
Gallons of water per foot	Feet of water in well	Gallons of water in well	3 casing volumes to be removed
0.1631	6.47	1.055257	3.17

Time (military)	pH (su)	EC (ms)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. Gallons	Comments/Flow Rate
13:29	7.35	4.51	15.8				0.25	Slight HC odor, slight sheen, light grey, slight turbidity
13:30	7.12	4.51	14.5				0.5	Increasing turbidity, dark grey
13:31	7.12	4.50	13.9				0.75	Black
13:32	7.07	4.50	13.8				1	No change
13:34	7.19	4.52	13.6				2	Increasing HC odor
13:36	7.42	4.48	13.7				2.5	Bailing down
13:38	7.46	4.49	13.8				2.75	No change
13:50	7.34	4.53	13.8				3	Strong HC odor
13:51	7.31	4.51	13.5				3.25	No change
13:51	7.31	4.50	13.4				3.5	No change
Final:	7.31	4.50	13.4				3.5	

COMMENTS: MW-6 casing is broken just below the ground surface & needs repair. Stickup is still present, but not secure.

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: on site sump

Sample ID: MW-5 | Sample Time: 13:26

Analysis Requested: ☑ BTEX ☐ VOC: ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: No | Duplicate Sample: No

SAMPLING PURGE LOG

Project Name:	XTO Groundwater Monitoring	Location:	Rowland	Well No:	MW-5
Client:	XTO	Date:	9/13/2011	Time:	11:15
Project Manager:	Julie Linn	Sampler's Name:	Sam LaRue		

Measuring Point:	TOC	Depth to Water:	7.7	ft	Depth to Product:	NA	ft
Well Diameter:	2"	Total Depth:	15.17	ft	Product Thickness:	NA	ft
		Water Column Height:	7.47	ft			

Sampling Method: [ ] Submersible Pump [ ] Centrifugal Pump [ ] Peristaltic Pump
[X] Bottom Valve Bailer [ ] Double Check Valve Bailer [ ] Other _____

Criteria: [X] 3 to 5 Casing Volumes of Water Removed [ ] Other _____
[X] Stabilization of Indicator Parameters

Water Volume in Well			
Gallons of water per foot	Feet of water in well	Gallons of water in well	3 casing volumes to be removed
0.1631	7.47	1.218357	3.66

Time (Military)	Vol. Evac. (gallons)	pH (standard units)	Conductivity (millisiemens)	Temperature (°C)	Comments/Flow Rate
11:22	0.25	6.58	3.57	20.5	Clear grey black HC odor
11:24	0.5	6.56	3.56	20.2	No Change
11:26	0.75	6.57	3.60	19.4	Darker grey/black, HC odor
11:28	1	6.64	3.60	19.4	Slightly silty grey/black, HC odor
11:31	1.25	6.63	3.60	19.6	No Change
11:33	1.5	6.58	3.63	19.5	No Change
11:34	1.75	6.59	3.67	19.3	No Change
11:36	2	6.59	3.61	19.4	No Change
11:38	2.25	6.57	3.68	19.3	black silty, strong HC odor
11:40	2.75	6.55	3.66	19.4	No Change
11:41	3.25	6.55	3.72	18.9	No Change
11:42	3.5	6.59	3.67	18.6	No Change
11:43	3.75	6.55	3.70	18.6	No Change
Final:	**3.75**	**6.55**	**3.7**	**18.6**	

COMMENTS: Depth to Water in feet below top of casing in other MWs on site:
MW-3: 11.67 MW-4R: 7.75 MW-6: 11.55

Instrumentation: [X] pH Meter [X] Conductivity Meter [ ] DO Meter [X] Temperature Meter
[ ] Other _____

Water Disposal: On site sump

Sample ID: MW-5 Sample Time: 11:47

Analysis Requested: [X] BTEX [ ] VOCs [ ] TDS [ ] Chloride [ ] Cations [ ] Anions [ ] Alkalinity
[ ] Metals [ ] Nitrate [ ] Nitrite [ ] Sulfate [ ] Other _____

Trip Blank: No Duplicate Sample: No Duplicate Sample ID: _____

SAMPLING PURGE LOG

Project Name: XTO Groundwater
Client: XTO Energy, Inc.
Project Manager: Julie Linn

Location: Rowland
Date: 12/14/2011
Sampler's Name: Devin Hencmann

Well No: MW-5
Time: 13:01

Measuring Point: TOC
Well Diameter: 2"

Depth to Water: 10.33 ft
Total Depth: 15.2 ft
Water Column Height: 4.87 ft

Depth to Product: NA ft
Product Thickness: NA ft

Sampling Method: ☐ Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other
☑ Bottom Valve Bailer ☐ Double Check Valve Bailer

Criteria: ☑ 3 to 5 Casing Volumes of Water Removal ☑ Stabilization of Indicator Parameters ☐ Other

Water Volume in Well			
Gallons of water per foot	Feet of water in well	Gallons of water in well	3 casing volumes to be removed
0.1631	4.87	0.794297	2.38

Time (military)	pH (su)	EC (ms)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. Gallons	Comments/Flow Rate
13:05	7.62	3.64	14.8				0.25	black, strong HC/ Sulfer odor
	7.61	3.64	14.6				0.50	Black, strong odor
	7.59	3.68	14.7				0.75	dark black, strong odor
	7.59	3.66	14.6				1.00	no change
	7.61	3.73	14.3				1.25	no change
	7.62	3.71	14.4				1.5	no change
	7.63	3.70	14.6				1.75	Black, strong odor
	7.65	3.70	14.5				2.00	black, strong odor, bailing down
	7.66	3.70	14.7				2.25	no change
Final: 13:30	7.68	3.70	14.5				2.50	black, strong odor, bailing down

COMMENTS:

Instrumentation: ☑ pH Meter ☐ DO Monitor ☑ Conductivity Meter ☑ Temperature Meter ☐ Other

Water Disposal: on site sump

Sample ID: MW-5 Sample Time: 13:35

Analysis Requested: ☑ BTEX ☐ VOCs ☐ Alkalinity ☐ TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Metals
☐ Other

Trip Blank: No Duplicate Sample: No

Attachment 4

LT Environmental Work Plan

COMPLIANCE / ENGINEERING / REMEDIATION

LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301
T 970.385.1096 / F 970.385.1873

January 28, 2011

Mr. James McDaniel
XTO Energy, Inc.
382 Road 3100
Aztec, New Mexico 87410

RE: Hydrogen Peroxide Injection Work Plan
XTO Energy, Inc.
Rowland Gas Com #1
Farmington, New Mexico

Dear Mr. McDaniel:

LT Environmental (LTE) presents the following scope of work to XTO Energy, Inc. (XTO) to conduct hydrogen peroxide injection as a remedial alternative at the Rowland Gas Com #1 site (site). XTO intends to pursue this remedial alternative to address the petroleum hydrocarbon impacts to the groundwater at the site. A cost estimate for these activities will be sent under a separate cover letter.

Site Description

The site is located at latitude 36.779300° north by -108.043654° west, World Geodetic System 1984 (WGS 84) in San Juan County, New Mexico. It is on the west side of Road 3100 in between Road 3175 and Road 3177 in Farmington, New Mexico.

Groundwater at the Site contains concentrations of benzene, toluene, ethylbenzene and total xylenes (BTEX) in excess of the New Mexico Water Quality Control Commission (NMWQCC) standards as a result of unlined pits previously used at the site. Soils impacted by an unlined production pit and an unlined separator pit were excavated in 1993. Groundwater was encountered within the production pit excavation, and six groundwater monitoring wells were later installed. Based on initial sampling results from MW-1 and MW-2, which indicated that BTEX concentrations were non-detect or below NMWQCC standards, sampling was discontinued at these wells. BTEX concentrations in MW-3 and MW-6 were also below NMWQCC standards, but these wells were placed on an annual sampling schedule to monitor potential migration of BTEX constituents identified in groundwater from MW-4 and MW-5. In 1998, MW-4 was damaged and replaced by MW-4R. The new well was positioned closer to the original production pit excavation.

Annual sampling results through 2004 indicated that BTEX concentrations were consistently beneath detection levels in MW-3, MW-4R and MW-6, so sampling was discontinued in all wells except MW-5. MW-5 has been sampled on a quarterly schedule since 2007. Table 1 provides historical sample results. Benzene concentrations in MW-5

have been highly variable, ranging from 1,270 µg/l to 10 µg/l. The most recent benzene concentrations have been from 120 µg/l to 340 µg/l during 2010. Concentrations of total xylenes have steadily declined in MW-5 from 3,000 µg/l to 600 µg/l. Toluene and ethylbenzene concentrations are below NMWQCC standards.

Groundwater is encountered at a depth from approximately 7.5 to 15.5 feet below ground surface (bgs) at the site. An irrigation ditch is located approximately 250 feet west of the site. The flow of water in the ditch impacts the depth to groundwater and groundwater flow direction. Groundwater flow direction is variable, flowing to the east when the irrigation ditch contains water. If the ditch does not contain water, groundwater flow direction varies from the southeast to the northeast. Both depth to groundwater and groundwater flow direction vary seasonally, and are highly influenced by the flow of water in the irrigation ditch.

Lithology at the site is not known.

Scope of Work

Currently, the only remedial action at this site is monitored natural attenuation. XTO desires to pursue a more aggressive remedial option, consisting of slugs of liquid hydrogen peroxide poured into MW-5. The following sequence of events for the hydrogen peroxide injections at the Site is suggested:

1. Purge the groundwater from MW-5 until dry.
2. Pour hydrogen peroxide into each well casing until the hydrogen peroxide is within 6 inches of the top of the casing and stays that way for a period of 2 minutes.
3. The concentration of the hydrogen peroxide will not exceed 8%, the concentration at which hydrogen peroxide is classified as a hazardous material (Class 1 Oxidizer) by the U.S. Department of Transportation. The total volume of MW-5 is 2.4 gallons. These volumes will be used as a starting point for well application. Additional volumes may be necessary.
4. Wait 7 days.
5. Measure depth to groundwater in MW-5.
6. Purge three well casing volumes from MW-5. If three well casing volumes cannot be purged, then purge the wells until dry. Parameters including pH, electrical conductivity, and temperature will be monitored during purging. Collect a groundwater sample for analysis of BTEX by EPA Method 8021B to determine effectiveness of the treatment and alter hydrogen peroxide concentrations and volumes as necessary.
7. Repeat steps 1 through 6 weekly for a total of 4 weeks.
8. Measure depth to groundwater in MW-5.
9. Purge three well casing volumes from MW-5. If three well casing volumes cannot be purged, then purge the wells until dry. Collect a weekly groundwater sample for

analysis of BTEX by EPA Method 8021B for an additional 4 weeks to determine if rebound of BTEX concentrations occurs.

10. Analyze results and make recommendations for additional treatment or monitoring.

All samples will be shipped via overnight courier to ESC analytical laboratories in Mt. Juliet, Tennessee for analysis with a standard turn-around time. No quality assurance/quality control samples (i.e. trip blanks or field blanks) will be used.

LTE will prepare a site specific health and safety plan (HASP) for the hydrogen peroxide injection and the groundwater sampling activities. A cost estimate for this work plan will be transmitted to XTO under a separate cover letter.

Schedule

LTE plans to implement this plan in March and April of 2011. Upon completion of the 8 weeks of activities, LTE will evaluate the data and submit a report to XTO. The report will include recommendations for any additional activities at the site.

Sincerely,

LT ENVIRONMENTAL, INC.

Julie Linn, P.G.
Senior Geologist

Copy: Ashley Ager, LTE