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Directional Survey**



**NM OIL CONSERVATION
ARTESIA DISTRICT**

MAY 10 2018

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XTO ENERGY, INC.

Eddy County, NM

Sec 21, T22S, R30E

James Ranch Unit DI 1 #127H

Wellbore #1

30-015-43231

Design: Wellbore #1

QES Survey Report

12 December, 2017





Survey Report



Company:	XTO ENERGY, INC.	Local Co-ordinate Reference:	Well James Ranch Unit DI 1 #127H
Project:	Eddy County, NM	TVD Reference:	RKB @ 3191.0usft (Noram 25)
Site:	Sec 21, T22S, R30E	MD Reference:	RKB @ 3191.0usft (Noram 25)
Well:	James Ranch Unit DI 1 #127H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec 21, T22S, R30E				
Site Position:		Northing:	502,495.20 usft	Latitude:	32° 22' 50.401 N
From:	Map	Easting:	639,272.00 usft	Longitude:	103° 52' 55.882 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.24 °

Well	James Ranch Unit DI 1 #127H					
Well Position	+N/-S	0.0 usft	Northing:	502,575.88 usft	Latitude:	32° 22' 51.193 N
	+E/-W	0.0 usft	Easting:	639,423.35 usft	Longitude:	103° 52' 54.113 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,167.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/14/2017	7.07	60.15	47,957.90538309

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	89.31	

Survey Program	Date 12/12/2017				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	18,164.0	MWD Surveys (Wellbore #1)	MWD	OWSG MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
First MWD Survey @ 105.0' MD / 105.0' TVD										
105.0	0.53	303.00	105.0	0.3	-0.4	-0.4	0.50	0.50	0.00	
133.0	0.58	304.00	133.0	0.4	-0.6	-0.6	0.18	0.18	3.57	
163.0	0.75	308.00	163.0	0.6	-0.9	-0.9	0.59	0.57	13.33	
226.0	0.46	333.00	226.0	1.1	-1.4	-1.3	0.61	-0.46	39.68	
257.0	0.16	333.00	257.0	1.2	-1.4	-1.4	0.97	-0.97	0.00	
287.0	0.32	35.00	287.0	1.4	-1.4	-1.4	0.94	0.53	206.67	
316.0	0.17	106.00	316.0	1.4	-1.3	-1.3	1.07	-0.52	244.83	
343.0	0.26	358.00	343.0	1.5	-1.3	-1.3	1.30	0.33	-400.00	
376.0	0.65	59.00	376.0	1.6	-1.1	-1.1	1.73	1.18	184.85	



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TVD Reference: RKB @ 3191.0usft (Noram 25)
MD Reference: RKB @ 3191.0usft (Noram 25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
406.0	0.65	57.00	406.0	1.8	-0.8	-0.8	0.08	0.00	-6.67
436.0	0.66	71.00	436.0	2.0	-0.5	-0.5	0.53	0.03	46.67
464.0	0.79	73.00	464.0	2.1	-0.2	-0.2	0.47	0.46	7.14
490.0	0.74	71.00	490.0	2.2	0.1	0.2	0.22	-0.19	-7.69
522.0	0.74	77.00	522.0	2.3	0.5	0.6	0.24	0.00	18.75
589.0	1.70	94.40	589.0	2.3	2.0	2.0	1.52	1.43	25.97
621.0	2.40	96.30	620.9	2.2	3.1	3.1	2.20	2.19	5.94
684.0	2.80	99.30	683.9	1.8	5.9	5.9	0.67	0.63	4.76
731.0	2.90	95.20	730.8	1.5	8.2	8.3	0.48	0.21	-8.72
825.0	2.60	91.60	824.7	1.2	12.7	12.8	0.37	-0.32	-3.83
920.0	1.70	50.20	919.6	2.1	16.0	16.0	1.83	-0.95	-43.58
1,015.0	1.90	30.70	1,014.6	4.3	17.9	17.9	0.67	0.21	-20.53
1,110.0	0.50	107.30	1,109.6	5.6	19.1	19.1	1.95	-1.47	80.63
1,204.0	1.40	119.10	1,203.6	4.9	20.5	20.5	0.97	0.96	12.55
1,300.0	2.90	101.30	1,299.5	3.8	23.9	23.9	1.69	1.56	-18.54
1,395.0	3.80	101.00	1,394.3	2.8	29.3	29.3	0.95	0.95	-0.32
1,489.0	3.30	75.00	1,488.2	2.9	35.0	35.0	1.78	-0.53	-27.66
1,584.0	3.10	61.30	1,583.0	4.8	39.9	39.9	0.83	-0.21	-14.42
1,678.0	2.70	70.00	1,676.9	6.8	44.2	44.3	0.63	-0.43	9.26
1,773.0	2.10	78.40	1,771.8	7.9	48.0	48.1	0.73	-0.63	8.84
1,867.0	2.00	73.20	1,865.8	8.7	51.2	51.4	0.22	-0.11	-5.53
1,962.0	1.40	65.30	1,960.7	9.7	53.9	54.0	0.68	-0.63	-8.32
2,056.0	1.60	82.30	2,054.7	10.4	56.2	56.4	0.52	0.21	18.09
2,151.0	2.10	95.20	2,149.6	10.4	59.3	59.4	0.68	0.53	13.58
2,246.0	1.80	87.00	2,244.6	10.3	62.5	62.6	0.43	-0.32	-8.63
2,341.0	1.40	93.70	2,339.5	10.3	65.2	65.3	0.46	-0.42	7.05
2,436.0	0.80	95.30	2,434.5	10.2	67.0	67.1	0.63	-0.63	1.68
2,531.0	1.90	83.80	2,529.5	10.3	69.2	69.3	1.19	1.16	-12.11
2,626.0	2.90	84.20	2,624.4	10.7	73.2	73.3	1.05	1.05	0.42
2,721.0	3.00	87.60	2,719.3	11.0	78.0	78.2	0.21	0.11	3.58
2,816.0	1.90	105.30	2,814.2	10.7	82.0	82.2	1.39	-1.16	18.63
2,911.0	1.40	113.20	2,909.2	9.8	84.6	84.7	0.58	-0.53	8.32
3,006.0	2.10	76.30	3,004.1	9.8	87.4	87.5	1.36	0.74	-38.84
3,100.0	2.70	72.30	3,098.0	10.9	91.2	91.3	0.66	0.64	-4.26
3,194.0	1.20	72.30	3,192.0	11.9	94.2	94.3	1.60	-1.60	0.00
3,289.0	0.90	107.70	3,287.0	11.9	95.9	96.0	0.74	-0.32	37.26
3,383.0	1.70	85.90	3,380.9	11.8	98.0	98.1	0.99	0.85	-23.19
3,478.0	1.80	88.70	3,475.9	11.9	100.9	101.0	0.14	0.11	2.95
3,624.0	0.50	62.70	3,621.9	12.3	103.7	103.9	0.94	-0.89	-17.81
3,719.0	1.90	77.50	3,716.8	12.8	105.6	105.8	1.50	1.47	15.58
3,813.0	2.40	78.30	3,810.8	13.5	109.1	109.2	0.53	0.53	0.85
3,907.0	2.30	76.60	3,904.7	14.4	112.8	113.0	0.13	-0.11	-1.81
4,002.0	2.20	77.00	3,999.6	15.2	116.5	116.6	0.11	-0.11	0.42



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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,096.0	2.10	74.00	4,093.5	16.1	119.9	120.1	0.16	-0.11	-3.19
4,191.0	2.10	71.40	4,188.5	17.2	123.2	123.4	0.10	0.00	-2.74
4,286.0	2.30	94.70	4,283.4	17.6	126.7	127.0	0.96	0.21	24.53
4,380.0	2.50	101.70	4,377.3	17.0	130.6	130.8	0.38	0.21	7.45
4,474.0	2.40	104.00	4,471.2	16.1	134.6	134.7	0.15	-0.11	2.45
4,569.0	2.40	83.20	4,566.2	15.8	138.5	138.6	0.91	0.00	-21.89
4,663.0	2.60	74.70	4,660.1	16.6	142.5	142.7	0.45	0.21	-9.04
4,757.0	2.50	75.60	4,754.0	17.7	146.5	146.7	0.11	-0.11	0.96
4,852.0	2.50	73.60	4,848.9	18.8	150.5	150.7	0.09	0.00	-2.11
4,947.0	2.60	77.20	4,943.8	19.9	154.6	154.8	0.20	0.11	3.79
5,042.0	2.50	77.30	5,038.7	20.8	158.7	159.0	0.11	-0.11	0.11
5,136.0	1.80	81.50	5,132.6	21.5	162.2	162.4	0.76	-0.74	4.47
5,231.0	1.60	85.40	5,227.6	21.8	165.0	165.2	0.24	-0.21	4.11
5,326.0	1.60	81.50	5,322.6	22.1	167.6	167.9	0.11	0.00	-4.11
5,420.0	1.70	85.10	5,416.5	22.4	170.3	170.6	0.15	0.11	3.83
5,514.0	1.60	87.30	5,510.5	22.6	173.0	173.3	0.13	-0.11	2.34
5,608.0	1.80	87.80	5,604.4	22.7	175.8	176.0	0.21	0.21	0.53
5,702.0	1.80	87.70	5,698.4	22.8	178.7	179.0	0.00	0.00	-0.11
5,795.0	1.70	90.80	5,791.4	22.9	181.6	181.8	0.15	-0.11	3.33
5,889.0	2.30	71.20	5,885.3	23.5	184.8	185.0	0.96	0.64	-20.85
5,983.0	2.50	69.30	5,979.2	24.8	188.5	188.7	0.23	0.21	-2.02
6,078.0	2.30	69.60	6,074.1	26.2	192.2	192.5	0.21	-0.21	0.32
6,173.0	2.20	70.70	6,169.1	27.5	195.7	196.0	0.11	-0.11	1.16
6,267.0	2.20	70.50	6,263.0	28.7	199.1	199.4	0.01	0.00	-0.21
6,362.0	2.30	89.60	6,357.9	29.3	202.7	203.1	0.79	0.11	20.11
6,457.0	2.30	94.10	6,452.8	29.2	206.5	206.9	0.19	0.00	4.74
6,551.0	2.10	96.30	6,546.8	28.8	210.1	210.4	0.23	-0.21	2.34
6,645.0	1.90	94.90	6,640.7	28.5	213.4	213.7	0.22	-0.21	-1.49
6,739.0	2.00	96.80	6,734.7	28.2	216.6	216.9	0.13	0.11	2.02
6,834.0	2.00	102.80	6,829.6	27.6	219.8	220.1	0.22	0.00	6.32
6,928.0	2.20	89.90	6,923.5	27.3	223.2	223.5	0.54	0.21	-13.72
7,023.0	2.40	90.60	7,018.5	27.2	227.0	227.4	0.21	0.21	0.74
7,118.0	2.20	90.60	7,113.4	27.2	230.9	231.2	0.21	-0.21	0.00
7,211.0	1.80	100.60	7,206.3	26.9	234.1	234.4	0.57	-0.43	10.75
7,306.0	1.80	80.30	7,301.3	26.9	237.0	237.3	0.67	0.00	-21.37
7,400.0	1.70	68.70	7,395.2	27.6	239.8	240.1	0.39	-0.11	-12.34
7,495.0	1.20	68.20	7,490.2	28.5	242.0	242.3	0.53	-0.53	-0.53
7,590.0	1.70	66.60	7,585.2	29.5	244.2	244.6	0.53	0.53	-1.68
7,685.0	2.80	76.70	7,680.1	30.5	247.8	248.1	1.23	1.16	10.63
7,779.0	2.20	80.50	7,774.0	31.4	251.8	252.1	0.66	-0.64	4.04
7,875.0	1.60	77.30	7,870.0	32.0	254.9	255.3	0.63	-0.63	-3.33
7,969.0	1.50	97.80	7,963.9	32.1	257.4	257.8	0.60	-0.11	21.81
8,064.0	1.70	131.50	8,058.9	31.0	259.7	260.0	1.00	0.21	35.47



Survey Report



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Wellbore: Wellbore #1
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8,157.0	2.00	167.20	8,151.8	28.5	261.1	261.4	1.26	0.32	38.39
8,251.0	2.10	167.40	8,245.8	25.2	261.8	262.1	0.11	0.11	0.21
8,343.0	2.20	174.80	8,337.7	21.8	262.4	262.6	0.32	0.11	8.04
8,436.0	2.50	180.60	8,430.6	18.0	262.5	262.7	0.41	0.32	6.24
8,530.0	2.40	181.60	8,524.6	14.0	262.4	262.6	0.12	-0.11	1.06
8,624.0	1.80	180.80	8,618.5	10.5	262.3	262.5	0.64	-0.64	-0.85
8,717.0	1.70	194.50	8,711.4	7.7	262.0	262.1	0.46	-0.11	14.73
8,759.0	1.80	204.20	8,753.4	6.5	261.6	261.6	0.74	0.24	23.10
8,790.0	1.60	214.20	8,784.4	5.7	261.1	261.2	1.15	-0.65	32.26
8,820.0	1.00	128.60	8,814.4	5.2	261.1	261.1	6.07	-2.00	-285.33
8,852.0	3.30	91.50	8,846.4	5.0	262.2	262.3	8.04	7.19	-115.94
8,883.0	6.00	81.90	8,877.3	5.2	264.7	264.8	9.03	8.71	-30.97
8,914.0	8.40	79.60	8,908.0	5.9	268.5	268.6	7.80	7.74	-7.42
8,946.0	10.90	84.70	8,939.6	6.6	273.9	273.9	8.25	7.81	15.94
8,977.0	12.90	90.30	8,969.9	6.8	280.2	280.3	7.44	6.45	18.06
9,008.0	15.30	94.00	9,000.0	6.5	287.8	287.8	8.27	7.74	11.94
9,039.0	17.90	95.80	9,029.7	5.8	296.6	296.6	8.55	8.39	5.81
9,071.0	20.00	99.60	9,059.9	4.4	306.9	306.9	7.61	6.56	11.88
9,102.0	23.00	100.70	9,088.8	2.3	318.1	318.1	9.76	9.68	3.55
9,134.0	25.50	100.30	9,118.0	-0.1	331.0	331.0	7.83	7.81	-1.25
9,165.0	28.10	99.30	9,145.6	-2.4	344.8	344.7	8.51	8.39	-3.23
9,197.0	30.70	97.20	9,173.5	-4.7	360.3	360.2	8.74	8.13	-6.56
9,228.0	33.20	94.20	9,199.8	-6.3	376.6	376.5	9.55	8.06	-9.68
9,260.0	35.90	91.90	9,226.2	-7.2	394.7	394.6	9.37	8.44	-7.19
9,291.0	38.80	90.00	9,250.8	-7.5	413.5	413.4	10.07	9.35	-6.13
9,322.0	41.60	89.40	9,274.5	-7.4	433.6	433.4	9.12	9.03	-1.94
9,353.0	44.40	86.30	9,297.2	-6.6	454.7	454.6	11.32	9.03	-10.00
9,384.0	46.70	82.80	9,318.9	-4.5	476.7	476.6	10.95	7.42	-11.29
9,416.0	49.10	79.40	9,340.3	-0.8	500.1	500.1	10.88	7.50	-10.63
9,447.0	50.50	79.80	9,360.3	3.5	523.4	523.4	4.62	4.52	1.29
9,479.0	52.30	79.20	9,380.3	8.0	548.0	548.1	5.81	5.63	-1.88
9,510.0	54.30	79.40	9,398.8	12.6	572.4	572.5	6.47	6.45	0.65
9,541.0	56.50	80.30	9,416.4	17.1	597.6	597.7	7.49	7.10	2.90
9,573.0	58.60	82.40	9,433.6	21.2	624.2	624.5	8.59	6.56	6.56
9,605.0	61.40	81.90	9,449.6	25.0	651.7	652.0	8.85	8.75	-1.56
9,637.0	65.00	80.60	9,464.0	29.3	679.9	680.2	11.82	11.25	-4.06
9,668.0	68.10	81.00	9,476.4	33.9	708.0	708.3	10.07	10.00	1.29
9,700.0	72.10	81.50	9,487.2	38.4	737.7	738.1	12.59	12.50	1.56
9,731.0	75.50	82.40	9,495.9	42.6	767.2	767.7	11.32	10.97	2.90
9,763.0	79.10	83.60	9,502.9	46.4	798.2	798.7	11.83	11.25	3.75
9,794.0	82.00	84.70	9,508.0	49.5	828.6	829.1	9.99	9.35	3.55
9,826.0	85.60	84.50	9,511.5	52.5	860.3	860.8	11.27	11.25	-0.63
9,857.0	86.70	84.30	9,513.5	55.5	891.0	891.6	3.61	3.55	-0.65
9,889.0	86.80	84.20	9,515.4	58.7	922.8	923.5	0.44	0.31	-0.31



Survey Report



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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well James Ranch Unit DI 1 #127H
TVD Reference: RKB @ 3191.0usft (Noram 25)
MD Reference: RKB @ 3191.0usft (Noram 25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,984.0	87.90	84.60	9,519.8	68.0	1,017.3	1,018.0	1.23	1.16	0.42
10,078.0	88.60	85.10	9,522.6	76.4	1,110.8	1,111.7	0.91	0.74	0.53
10,173.0	88.90	84.20	9,524.7	85.3	1,205.4	1,206.4	1.00	0.32	-0.95
10,268.0	89.20	85.10	9,526.3	94.1	1,300.0	1,301.0	1.00	0.32	0.95
10,363.0	88.80	85.90	9,527.9	101.6	1,394.7	1,395.8	0.94	-0.42	0.84
10,457.0	90.30	89.40	9,528.7	105.4	1,488.6	1,489.7	4.05	1.60	3.72
10,551.0	90.00	89.70	9,528.4	106.2	1,582.6	1,583.7	0.45	-0.32	0.32
10,644.0	90.60	90.50	9,527.9	106.0	1,675.6	1,676.7	1.08	0.65	0.86
10,738.0	91.30	90.80	9,526.4	104.9	1,769.6	1,770.7	0.81	0.74	0.32
10,833.0	93.40	91.30	9,522.5	103.2	1,864.4	1,865.6	2.27	2.21	0.53
10,929.0	93.00	91.30	9,517.1	101.0	1,960.3	1,961.3	0.42	-0.42	0.00
11,023.0	93.10	91.70	9,512.1	98.6	2,054.1	2,055.1	0.44	0.11	0.43
11,118.0	90.90	91.10	9,508.8	96.3	2,149.0	2,150.0	2.40	-2.32	-0.63
11,212.0	89.80	90.10	9,508.2	95.3	2,243.0	2,244.0	1.58	-1.17	-1.06
11,307.0	89.10	90.20	9,509.1	95.0	2,338.0	2,339.0	0.74	-0.74	0.11
11,402.0	88.90	90.10	9,510.8	94.8	2,433.0	2,434.0	0.24	-0.21	-0.11
11,496.0	90.20	90.00	9,511.5	94.7	2,527.0	2,527.9	1.39	1.38	-0.11
11,591.0	90.50	89.30	9,511.0	95.3	2,622.0	2,622.9	0.80	0.32	-0.74
11,685.0	90.60	89.80	9,510.1	96.0	2,716.0	2,716.9	0.54	0.11	0.53
11,779.0	90.60	90.00	9,509.1	96.2	2,810.0	2,810.9	0.21	0.00	0.21
11,874.0	91.00	90.40	9,507.7	95.8	2,905.0	2,905.9	0.60	0.42	0.42
11,968.0	89.50	90.10	9,507.3	95.4	2,998.9	2,999.9	1.63	-1.60	-0.32
12,062.0	88.70	89.30	9,508.8	95.9	3,092.9	3,093.9	1.20	-0.85	-0.85
12,157.0	89.40	89.90	9,510.4	96.6	3,187.9	3,188.9	0.97	0.74	0.63
12,251.0	90.20	90.10	9,510.7	96.6	3,281.9	3,282.8	0.88	0.85	0.21
12,347.0	88.50	89.00	9,511.8	97.3	3,377.9	3,378.8	2.11	-1.77	-1.15
12,441.0	89.00	89.40	9,513.9	98.7	3,471.9	3,472.8	0.68	0.53	0.43
12,535.0	90.50	89.30	9,514.3	99.7	3,565.9	3,566.8	1.60	1.60	-0.11
12,630.0	90.70	89.40	9,513.3	100.8	3,660.9	3,661.8	0.24	0.21	0.11
12,723.0	90.60	89.60	9,512.2	101.6	3,753.8	3,754.8	0.24	-0.11	0.22
12,816.0	90.30	89.80	9,511.5	102.1	3,846.8	3,847.8	0.39	-0.32	0.22
12,910.0	89.50	89.30	9,511.7	102.8	3,940.8	3,941.8	1.00	-0.85	-0.53
13,004.0	89.40	89.30	9,512.6	104.0	4,034.8	4,035.8	0.11	-0.11	0.00
13,099.0	89.50	89.30	9,513.5	105.1	4,129.8	4,130.8	0.11	0.11	0.00
13,194.0	89.30	89.70	9,514.5	106.0	4,224.8	4,225.8	0.47	-0.21	0.42
13,288.0	89.00	89.40	9,515.9	106.7	4,318.8	4,319.8	0.45	-0.32	-0.32
13,383.0	88.40	89.20	9,518.0	107.9	4,413.8	4,414.7	0.67	-0.63	-0.21
13,477.0	89.40	90.00	9,519.8	108.5	4,507.7	4,508.7	1.36	1.06	0.85
13,572.0	90.20	90.10	9,520.1	108.4	4,602.7	4,603.7	0.85	0.84	0.11
13,665.0	90.20	89.50	9,519.8	108.8	4,695.7	4,696.7	0.65	0.00	-0.65
13,759.0	89.80	89.40	9,519.8	109.7	4,789.7	4,790.7	0.44	-0.43	-0.11
13,854.0	88.80	88.80	9,521.0	111.2	4,884.7	4,885.7	1.23	-1.05	-0.63
13,949.0	88.60	88.60	9,523.1	113.3	4,979.7	4,980.7	0.30	-0.21	-0.21



Survey Report



Company: XTO ENERGY, INC.
Project: Eddy County, NM
Site: Sec 21, T22S, R30E
Well: James Ranch Unit DI 1 #127H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well James Ranch Unit DI 1 #127H
TVD Reference: RKB @ 3191.0usft (Noram 25)
MD Reference: RKB @ 3191.0usft (Noram 25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,043.0	88.30	88.20	9,525.7	115.9	5,073.6	5,074.6	0.53	-0.32	-0.43
14,138.0	88.40	87.90	9,528.4	119.2	5,168.5	5,169.6	0.33	0.11	-0.32
14,260.0	89.20	88.70	9,531.0	122.8	5,290.4	5,291.5	0.93	0.66	0.66
14,355.0	89.90	89.70	9,531.7	124.1	5,385.4	5,386.5	1.28	0.74	1.05
14,449.0	90.20	90.80	9,531.6	123.7	5,479.4	5,480.5	1.21	0.32	1.17
14,544.0	90.10	90.90	9,531.4	122.3	5,574.4	5,575.4	0.15	-0.11	0.11
14,639.0	90.30	90.80	9,531.1	120.9	5,669.4	5,670.4	0.24	0.21	-0.11
14,733.0	90.20	91.00	9,530.6	119.4	5,763.4	5,764.4	0.24	-0.11	0.21
14,828.0	90.30	90.80	9,530.2	117.9	5,858.3	5,859.3	0.24	0.11	-0.21
14,923.0	90.30	91.30	9,529.7	116.2	5,953.3	5,954.3	0.53	0.00	0.53
15,017.0	90.00	91.30	9,529.5	114.0	6,047.3	6,048.2	0.32	-0.32	0.00
15,112.0	89.80	91.50	9,529.7	111.7	6,142.3	6,143.2	0.30	-0.21	0.21
15,207.0	89.60	91.40	9,530.1	109.3	6,237.2	6,238.1	0.24	-0.21	-0.11
15,302.0	89.20	91.30	9,531.1	107.1	6,332.2	6,333.0	0.43	-0.42	-0.11
15,397.0	89.20	91.10	9,532.5	105.1	6,427.2	6,428.0	0.21	0.00	-0.21
15,492.0	89.20	91.30	9,533.8	103.1	6,522.1	6,522.9	0.21	0.00	0.21
15,586.0	89.40	91.30	9,534.9	101.0	6,616.1	6,616.9	0.21	0.21	0.00
15,681.0	89.50	91.20	9,535.9	98.9	6,711.1	6,711.8	0.15	0.11	-0.11
15,775.0	89.30	91.30	9,536.8	96.9	6,805.1	6,805.7	0.24	-0.21	0.11
15,869.0	88.90	91.20	9,538.3	94.8	6,899.0	6,899.7	0.44	-0.43	-0.11
15,963.0	88.70	91.50	9,540.3	92.6	6,993.0	6,993.6	0.38	-0.21	0.32
16,058.0	88.20	91.50	9,542.9	90.1	7,087.9	7,088.5	0.53	-0.53	0.00
16,152.0	87.50	90.10	9,546.4	88.8	7,181.8	7,182.4	1.66	-0.74	-1.49
16,247.0	87.60	89.10	9,550.4	89.5	7,276.7	7,277.3	1.06	0.11	-1.05
16,341.0	88.20	89.30	9,553.9	90.8	7,370.7	7,371.2	0.67	0.64	0.21
16,436.0	88.50	88.20	9,556.6	92.8	7,465.6	7,466.2	1.20	0.32	-1.16
16,531.0	89.30	88.30	9,558.4	95.7	7,560.5	7,561.2	0.85	0.84	0.11
16,625.0	89.90	88.60	9,559.1	98.3	7,654.5	7,655.1	0.71	0.64	0.32
16,720.0	90.40	87.80	9,558.9	101.3	7,749.5	7,750.1	0.99	0.53	-0.84
16,814.0	90.70	87.80	9,558.0	104.9	7,843.4	7,844.1	0.32	0.32	0.00
16,909.0	90.20	88.70	9,557.2	107.8	7,938.3	7,939.1	1.08	-0.53	0.95
17,003.0	91.00	90.00	9,556.2	108.8	8,032.3	8,033.1	1.62	0.85	1.38
17,097.0	91.60	89.70	9,554.1	109.1	8,126.3	8,127.0	0.71	0.64	-0.32
17,192.0	91.00	89.70	9,551.9	109.6	8,221.3	8,222.0	0.63	-0.63	0.00
17,287.0	90.50	89.80	9,550.7	110.0	8,316.3	8,317.0	0.54	-0.53	0.11
17,382.0	89.90	89.80	9,550.4	110.3	8,411.3	8,412.0	0.63	-0.63	0.00
17,476.0	89.60	90.00	9,550.8	110.5	8,505.3	8,506.0	0.38	-0.32	0.21
17,570.0	89.40	89.80	9,551.6	110.7	8,599.3	8,600.0	0.30	-0.21	-0.21
17,664.0	89.10	89.70	9,552.8	111.1	8,693.2	8,694.0	0.34	-0.32	-0.11
17,759.0	88.70	89.40	9,554.6	111.8	8,788.2	8,788.9	0.53	-0.42	-0.32
17,854.0	88.10	88.80	9,557.3	113.3	8,883.2	8,883.9	0.89	-0.63	-0.63
17,948.0	87.80	89.20	9,560.7	114.9	8,977.1	8,977.8	0.53	-0.32	0.43
18,042.0	88.20	89.10	9,563.9	116.3	9,071.0	9,071.8	0.44	0.43	-0.11



Survey Report



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Design: Wellbore #1

Local Co-ordinate Reference: Well James Ranch Unit DI 1 #127H
TVD Reference: RKB @ 3191.0usft (Noram 25)
MD Reference: RKB @ 3191.0usft (Noram 25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,090.0	88.60	89.20	9,565.3	117.0	9,119.0	9,119.8	0.86	0.83	0.21
TD @ 18164.0' MD / 9567.1' TVD									
18,164.0	88.60	89.20	9,567.1	118.1	9,193.0	9,193.7	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
105.0	105.0	0.3	-0.4	First MWD Survey @ 105.0' MD / 105.0' TVD
18,164.0	9,567.1	118.1	9,193.0	TD @ 18164.0' MD / 9567.1' TVD

Checked By: _____ Approved By: _____ Date: _____