

30-015-43444



July 17, 2017

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 02 2017

RECEIVED

BOPCO, LP
(XTO Energy)
Well: Big Eddy Unit DI 5 24H (Pilot Hole)
County/Parish: Eddy County, NM

LEAM MWD: (Pilot Hole) from 0' MD – 9,752' MD
Projection: 9,812'

This Borehole Survey taken between 05/23/2017 and 06/07/2017 had been conducted and calculated according to the highest professional standards and complies with all known State and Federal requirements.

Reviewed and Approved:

Date: July 17, 2017



Survey Certification Form

State of New Mexico
Eddy County

I, Randy W. Rakowitz, certify that; I am employed by LEAM Drilling Services, that I did on the day(s) of 05/23/2017 through 06/07/2017, conduct or supervise the taking of MWD Survey from a depth of 0' MD to 9,812' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of BOPCO, LP (XTO Energy) for the Big Eddy Unit DI5 24H (Pilot Hole) in Eddy County, New Mexico; and that I reviewed this report and find that it conforms to the principals and procedures as set forth by LEAM Drilling Services.

A handwritten signature in black ink, appearing to read 'Randy W. Rakowitz', is written over a solid horizontal line.

Randy W. Rakowitz
MWD Operations Coordinator

LEAM Drilling Systems LLC

Survey Report

Company: XTO Energy, Inc.	Local Co-ordinate Reference: Well #24H	
Project: Eddy County, NM (NAD 27)	TVD Reference: GE 3523' + 25.5' RKB @ 3548.50usft (NoRam #25)	
Site: Big Eddy Unit Drilling Island 5	MD Reference: GE 3523' + 25.5' RKB @ 3548.50usft (NoRam #25)	
Well: #24H	North Reference: Grid	
Wellbore: Pilot Hole	Survey Calculation Method: Minimum Curvature	
Design: OH	Database: EDM 5000.1 Multi User Db	

Project Eddy County, NM (NAD 27)		
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 Big Eddy Unit Drilling Island 5

Site Position:	Northing: 562,648.55 usft	Latitude: 32° 32' 45.296 N
From: Map	Easting: 647,698.32 usft	Longitude: 103° 51' 14.471 W
Position Uncertainty: 0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.26 °

Well #24H

Well Position	Northing: 562,648.55 usft	Latitude: 32° 32' 45.296 N
+N/-S 0.00 usft	Easting: 647,698.32 usft	Longitude: 103° 51' 14.471 W
+E/-W 0.00 usft	Wellhead Elevation: 0.00 usft	Ground Level: 3,523.00 usft
Position Uncertainty 0.00 usft		

Wellbore Pilot Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/24/2017	7.33	60.45	48,367

Design OH

Audit Notes:

Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.00
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Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	89.57

Survey Program Date 7/17/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
176.00	1,440.00	Survey #1 (Pilot Hole)	LEAM MWD+HDGM	MWD+HDGM
1,500.00	2,761.00	Survey #2 (Pilot Hole)	VES GyroFlex V2	
2,887.00	9,752.00	Survey #3 (Pilot Hole)	LEAM MWD+HDGM	MWD+HDGM
9,812.00	9,812.00	Survey #4 (Pilot Hole)	Project	Projection

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
176.00	0.40	105.30	176.00	-0.16	0.59	0.59	0.23	0.23	0.00
234.00	0.50	73.90	234.00	-0.15	1.03	1.03	0.45	0.17	-54.14
325.00	0.50	76.00	324.99	0.06	1.80	1.80	0.02	0.00	2.31
415.00	0.70	122.40	414.99	-0.14	2.64	2.64	0.56	0.22	51.56
505.00	0.20	65.80	504.99	-0.37	3.25	3.25	0.68	-0.56	-62.89

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Well: #24H	North Reference: Grid	
Wellbore: Pilot Hole	Survey Calculation Method: Minimum Curvature	
Design: OH	Database: EDM 5000.1 Multi 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)
595.00	0.10	32.00	594.99	-0.24	3.44	3.43	0.14	-0.11	-37.56
685.00	0.40	320.70	684.99	0.07	3.28	3.28	0.42	0.33	-79.22
798.00	0.10	319.40	797.98	0.45	2.96	2.97	0.27	-0.27	-1.15
967.00	0.60	262.10	966.98	0.44	1.99	1.99	0.33	0.30	-33.91
1,062.00	0.40	229.10	1,061.98	0.16	1.25	1.25	0.36	-0.21	-34.74
1,156.00	0.60	342.30	1,155.97	0.41	0.85	0.85	0.90	0.21	120.43
1,250.00	0.20	273.70	1,249.97	0.89	0.54	0.54	0.59	-0.43	-72.98
1,345.00	0.40	323.00	1,344.97	1.17	0.17	0.18	0.33	0.21	51.89
1,440.00	0.40	2.30	1,439.97	1.76	-0.01	0.00	0.28	0.00	41.37
1,500.00	0.63	5.55	1,499.97	2.30	0.03	0.04	0.39	0.38	5.42
1,600.00	1.48	32.51	1,599.95	3.94	0.77	0.80	0.96	0.85	26.96
1,700.00	2.25	40.89	1,699.90	6.51	2.75	2.80	0.81	0.77	8.38
1,813.00	2.52	55.00	1,812.80	9.61	6.24	6.31	0.57	0.24	12.49
1,855.00	2.96	66.99	1,854.75	10.56	7.99	8.07	1.71	1.05	28.55
1,909.00	2.81	72.01	1,908.68	11.52	10.54	10.62	0.54	-0.28	9.30
1,941.00	2.23	80.65	1,940.65	11.86	11.90	11.99	2.16	-1.81	27.00
1,972.00	1.61	99.28	1,971.63	11.89	12.92	13.01	2.81	-2.00	60.10
2,004.00	1.25	138.45	2,003.63	11.56	13.60	13.68	3.18	-1.13	122.41
2,035.00	1.66	180.81	2,034.62	10.85	13.81	13.90	3.61	1.32	136.65
2,098.00	3.00	205.69	2,097.56	8.46	13.09	13.15	2.62	2.13	39.49
2,193.00	3.77	221.32	2,192.40	3.87	9.95	9.98	1.26	0.81	16.45
2,287.00	4.18	226.85	2,286.17	-0.79	5.41	5.40	0.60	0.44	5.88
2,382.00	4.70	228.91	2,380.89	-5.72	-0.05	-0.09	0.57	0.55	2.17
2,476.00	4.18	236.20	2,474.61	-10.16	-5.80	-5.88	0.82	-0.55	7.76
2,570.00	2.61	267.71	2,568.45	-12.15	-10.79	-10.88	2.54	-1.67	33.52
2,662.00	2.52	282.46	2,660.36	-11.80	-14.86	-14.94	0.72	-0.10	16.03
2,761.00	2.86	278.70	2,759.25	-10.95	-19.42	-19.50	0.39	0.34	-3.80
2,887.00	2.70	282.90	2,885.10	-9.82	-25.42	-25.50	0.21	-0.13	3.33
2,950.00	2.60	279.90	2,948.03	-9.24	-28.28	-28.34	0.27	-0.16	-4.76
3,044.00	2.40	271.30	3,041.94	-8.83	-32.34	-32.41	0.45	-0.21	-9.15
3,139.00	1.10	292.90	3,136.90	-8.43	-35.17	-35.24	1.51	-1.37	22.74
3,233.00	1.10	94.30	3,230.89	-8.14	-35.10	-35.16	2.31	0.00	171.70
3,327.00	1.20	95.70	3,324.87	-8.31	-33.23	-33.29	0.11	0.11	1.49
3,453.00	1.10	78.60	3,450.85	-8.20	-30.73	-30.79	0.28	-0.08	-13.57
3,531.00	0.90	98.50	3,528.83	-8.14	-29.39	-29.45	0.51	-0.26	25.51
3,626.00	0.90	102.40	3,623.82	-8.41	-27.92	-27.98	0.06	0.00	4.11
3,721.00	0.90	107.60	3,718.81	-8.80	-26.48	-26.55	0.09	0.00	5.47
3,815.00	0.90	113.30	3,812.80	-9.32	-25.10	-25.17	0.10	0.00	6.06
3,909.00	0.80	127.00	3,906.79	-10.00	-23.90	-23.97	0.24	-0.11	14.57
4,004.00	0.80	131.70	4,001.78	-10.84	-22.87	-22.95	0.07	0.00	4.95
4,098.00	0.90	126.10	4,095.77	-11.71	-21.79	-21.87	0.14	0.11	-5.96
4,193.00	1.00	135.40	4,190.76	-12.74	-20.60	-20.70	0.19	0.11	9.79

LEAM Drilling Systems LLC

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Wellbore: Pilot Hole	Survey Calculation Method: Minimum Curvature	
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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)
4,288.00	0.40	126.40	4,285.75	-13.53	-19.75	-19.85	0.64	-0.63	-9.47
4,383.00	0.40	109.70	4,380.75	-13.84	-19.17	-19.28	0.12	0.00	-17.58
4,477.00	0.50	126.60	4,474.74	-14.19	-18.53	-18.64	0.18	0.11	17.98
4,572.00	0.60	125.60	4,569.74	-14.73	-17.80	-17.91	0.11	0.11	-1.05
4,666.00	0.80	126.30	4,663.73	-15.41	-16.87	-16.98	0.21	0.21	0.74
4,761.00	1.00	122.90	4,758.72	-16.25	-15.64	-15.76	0.22	0.21	-3.58
4,855.00	0.40	8.80	4,852.72	-16.37	-14.90	-15.02	1.30	-0.64	-121.38
4,949.00	0.40	350.20	4,946.71	-15.72	-14.90	-15.02	0.14	0.00	-19.79
5,043.00	0.50	342.60	5,040.71	-15.01	-15.08	-15.19	0.12	0.11	-8.09
5,137.00	0.50	340.90	5,134.71	-14.23	-15.34	-15.45	0.02	0.00	-1.81
5,232.00	0.50	351.80	5,229.70	-13.43	-15.53	-15.63	0.10	0.00	11.47
5,326.00	0.50	353.50	5,323.70	-12.61	-15.64	-15.73	0.02	0.00	1.81
5,421.00	0.40	358.30	5,418.70	-11.87	-15.70	-15.78	0.11	-0.11	5.05
5,516.00	0.40	19.90	5,513.69	-11.23	-15.59	-15.68	0.16	0.00	22.74
5,610.00	0.40	21.80	5,607.69	-10.61	-15.36	-15.44	0.01	0.00	2.02
5,705.00	0.40	16.90	5,702.69	-9.99	-15.14	-15.21	0.04	0.00	-5.16
5,799.00	0.10	335.30	5,796.69	-9.60	-15.08	-15.15	0.35	-0.32	-44.26
5,893.00	0.10	95.30	5,890.69	-9.53	-15.03	-15.10	0.18	0.00	127.66
5,988.00	0.10	52.40	5,985.69	-9.49	-14.88	-14.95	0.08	0.00	-45.16
6,082.00	0.30	16.70	6,079.69	-9.20	-14.75	-14.82	0.24	0.21	-37.98
6,177.00	0.30	2.00	6,174.69	-8.72	-14.67	-14.73	0.08	0.00	-15.47
6,271.00	0.40	358.50	6,268.69	-8.14	-14.67	-14.73	0.11	0.11	-3.72
6,365.00	0.40	5.10	6,362.68	-7.49	-14.65	-14.70	0.05	0.00	7.02
6,459.00	0.50	3.00	6,456.68	-6.75	-14.60	-14.65	0.11	0.11	-2.23
6,553.00	0.60	12.50	6,550.68	-5.86	-14.47	-14.51	0.14	0.11	10.11
6,648.00	0.70	20.80	6,645.67	-4.83	-14.15	-14.19	0.14	0.11	8.74
6,742.00	0.80	23.30	6,739.66	-3.70	-13.69	-13.72	0.11	0.11	2.66
6,838.00	0.80	29.40	6,835.65	-2.50	-13.10	-13.12	0.09	0.00	6.35
6,932.00	0.80	343.90	6,929.64	-1.29	-12.96	-12.97	0.66	0.00	-48.40
7,026.00	0.20	219.60	7,023.64	-0.79	-13.24	-13.25	0.99	-0.64	-132.23
7,120.00	0.30	248.40	7,117.64	-1.01	-13.58	-13.58	0.17	0.11	30.64
7,213.00	0.50	273.90	7,210.64	-1.07	-14.21	-14.22	0.28	0.22	27.42
7,306.00	0.40	255.30	7,303.64	-1.12	-14.93	-14.93	0.19	-0.11	-20.00
7,400.00	0.60	217.30	7,397.63	-1.60	-15.54	-15.55	0.40	0.21	-40.43
7,493.00	0.70	241.40	7,490.63	-2.26	-16.34	-16.35	0.31	0.11	25.91
7,586.00	0.80	265.80	7,583.62	-2.58	-17.48	-17.50	0.36	0.11	26.24
7,679.00	1.40	287.50	7,676.60	-2.28	-19.21	-19.23	0.77	0.65	23.33
7,772.00	1.20	290.30	7,769.58	-1.60	-21.21	-21.22	0.23	-0.22	3.01
7,866.00	1.00	3.70	7,863.56	-0.44	-22.08	-22.08	1.41	-0.21	78.09
7,959.00	1.00	11.50	7,956.55	1.16	-21.87	-21.86	0.15	0.00	8.39
8,052.00	0.40	336.30	8,049.54	2.25	-21.83	-21.82	0.77	-0.65	-37.85
8,145.00	0.80	298.50	8,142.54	2.86	-22.54	-22.51	0.58	0.43	-40.65

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8,238.00	1.30	277.80	8,235.52	3.31	-24.15	-24.13	0.67	0.54	-22.26
8,331.00	1.00	321.40	8,328.51	4.09	-25.70	-25.67	0.97	-0.32	46.88
8,424.00	0.40	194.50	8,421.50	4.41	-26.29	-26.26	1.38	-0.65	-136.45
8,518.00	1.70	170.00	8,515.48	2.72	-26.13	-26.11	1.43	1.38	-26.06
8,611.00	0.70	185.00	8,608.46	0.80	-25.94	-25.93	1.12	-1.08	16.13
8,704.00	0.90	324.00	8,701.46	0.82	-26.42	-26.41	1.61	0.22	149.46
8,798.00	0.40	350.60	8,795.45	1.74	-26.91	-26.89	0.61	-0.53	28.30
8,893.00	0.60	339.50	8,890.45	2.54	-27.14	-27.12	0.23	0.21	-11.68
8,987.00	0.70	283.60	8,984.44	3.13	-27.87	-27.84	0.65	0.11	-59.47
9,080.00	0.70	278.80	9,077.44	3.35	-28.98	-28.95	0.06	0.00	-5.16
9,173.00	0.10	298.00	9,170.43	3.48	-29.61	-29.59	0.65	-0.65	20.65
9,267.00	0.40	270.90	9,264.43	3.52	-30.01	-29.99	0.33	0.32	-28.83
9,361.00	1.40	218.40	9,358.42	2.63	-31.05	-31.03	1.28	1.06	-55.85
9,454.00	1.80	199.20	9,451.38	0.36	-32.24	-32.24	0.71	0.43	-20.65
9,548.00	1.80	210.60	9,545.34	-2.31	-33.48	-33.49	0.38	0.00	12.13
9,642.00	2.00	207.60	9,639.29	-5.03	-34.99	-35.03	0.24	0.21	-3.19
9,737.00	1.90	166.90	9,734.24	-8.04	-35.40	-35.46	1.43	-0.11	-42.84
9,752.00	2.00	156.80	9,749.23	-8.52	-35.24	-35.30	2.38	0.67	-67.33
9,812.00	2.00	156.80	9,809.19	-10.44	-34.42	-34.49	0.00	0.00	0.00
Projection									