



NorAm Drilling Company

A GLOBAL RIG COMPANY ASA

Operator: XTO Energy

Well & Lease Number: PERLA NEGRA FED COM 2H

County: Lea

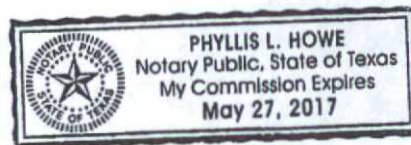
State of New Mexico

Deviation Report Rig#25

Footage	Degree
300	0.26
600	0.30
900	0.41
1200	0.29
1500	0.20
1800	0.31
2100	0.61
2400	0.52
2900	1.62
3400	2.18
3900	1.28
4400	1.63
4900	0.95
5400	0.52
5900	0.44
6400	0.73
6900	0.55
7400	0.62
7900	1.01
8400	0.58
8900	0.72
9400	1.70
9900	1.94
10090	1.86

Completed by: Will Luker

Will Luker, Safety Director
NorAm Drilling Company



Appeared before me on: 12/1/15

Notary Public: Phyllis L. Howe

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JAN 06 2016



XTO Energy Inc

Lea County, NM (NAD27)
Perla Negra Federal Com
2H

OH / Job# 1514019

Survey: Phoenix MWD Surveys

Standard Survey Report

28 August, 2015



Phoenix Technology Services LP

Survey Report



XTO ENERGY

Company: XTO Energy Inc
 Project: Lea County, NM (NAD27)
 Site: Perla Negra Federal Com
 Well: 2H
 Wellbore: OH / Job# 1514019
 Design: Surveys (Noram 25)

Local Co-ordinate Reference: Well 2H
 TVD Reference: RKB @ 3812.00usft (Noram 25)
 MD Reference: RKB @ 3812.00usft (Noram 25)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Compass 5000 GCR

Project	Lea County, NM (NAD27)		
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	Perla Negra Federal Com				
Site Position:		Northing:	597,390.80 usft	Latitude:	32° 38' 22.78876 N
From:	Map	Easting:	751,854.80 usft	Longitude:	103° 30' 54.59550 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.44 °

Well	2H					
Well Position	+N/-S	0.00 usft	Northing:	597,390.80 usft	Latitude:	32° 38' 22.78876 N
	+E/-W	0.00 usft	Easting:	751,854.80 usft	Longitude:	103° 30' 54.59550 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,787.00 usft

Wellbore	OH / Job# 1514019				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/16/2015	6.88	60.68	48,509

Design	Surveys (Noram 25)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	357.40	

Survey Program	Date 8/28/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	10,090.00	Phoenix Gyro Survey (OH / Job# 1514019)	PHX_SPT_GTD	PHX Continuous north-seeking gyro	
10,178.00	15,275.00	Phoenix MWD Surveys (OH / Job# 151401)	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

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)
10,090.00	1.86	161.45	10,088.31	-7.52	24.97	-8.64	0.00	0.00	0.00
Tie In to Phoenix Gyro Surveys									
10,178.00	2.60	4.40	10,176.29	-8.88	25.58	-8.03	4.97	0.84	-178.47
First Phoenix MWD Survey									
10,210.00	3.00	9.50	10,208.25	-5.33	25.77	-6.49	1.47	1.25	15.94
10,241.00	3.80	10.20	10,239.19	-3.52	26.09	-4.70	2.58	2.58	2.26
10,273.00	5.80	4.30	10,271.08	-0.86	26.40	-2.06	6.43	6.25	-18.44
10,304.00	8.50	4.10	10,301.84	2.98	26.68	1.77	8.71	8.71	-0.65
10,336.00	12.10	2.30	10,333.31	8.70	26.98	7.46	11.29	11.25	-5.63

Phoenix Technology Services LP
Survey Report



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Design: Surveys (Noram 25)

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MD Reference: RKB @ 3812.00usft (Noram 25)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

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)
10,367.00	15.70	1.60	10,363.40	16.14	27.23	14.89	11.63	11.61	-2.26
10,399.00	19.60	2.10	10,393.89	25.83	27.55	24.56	12.20	12.19	1.56
10,430.00	22.80	3.60	10,422.79	37.03	28.12	35.71	10.47	10.32	4.84
10,462.00	25.70	3.90	10,451.96	50.14	28.98	48.77	9.07	9.06	0.94
10,493.00	28.40	3.40	10,479.57	64.21	29.87	62.79	8.74	8.71	-1.61
10,525.00	29.90	1.80	10,507.51	79.78	30.57	78.31	5.28	4.69	-5.00
10,556.00	31.10	0.70	10,534.22	95.51	30.92	94.01	4.27	3.87	-3.55
10,588.00	32.30	0.60	10,561.45	112.32	31.11	110.79	3.75	3.75	-0.31
10,619.00	33.20	1.10	10,587.52	129.09	31.36	127.53	3.03	2.90	1.61
10,651.00	33.70	1.30	10,614.22	146.72	31.72	145.13	1.60	1.56	0.63
10,683.00	33.60	359.90	10,640.86	164.45	31.91	162.84	2.44	-0.31	-4.38
10,714.00	33.70	358.60	10,666.67	181.63	31.69	180.00	2.35	0.32	-4.19
10,746.00	33.40	357.60	10,693.34	199.30	31.10	197.69	1.97	-0.94	-3.13
10,777.00	34.60	356.00	10,719.04	216.61	30.13	215.02	4.83	3.87	-5.16
10,809.00	36.80	355.10	10,745.02	235.22	28.68	233.68	7.07	6.88	-2.81
10,840.00	39.20	353.80	10,769.45	254.22	26.82	252.74	8.16	7.74	-4.19
10,871.00	44.00	353.20	10,792.62	274.66	24.49	273.27	15.54	15.48	-1.94
10,903.00	50.00	352.40	10,814.44	297.87	21.55	296.58	18.84	18.75	-2.50
10,935.00	56.30	351.70	10,833.62	323.21	18.00	322.06	19.76	19.69	-2.19
10,966.00	63.20	351.10	10,849.23	349.67	14.00	348.68	22.32	22.26	-1.94
10,997.00	68.80	351.20	10,861.58	377.75	9.63	376.92	21.29	21.29	0.32
11,029.00	76.80	352.40	10,870.77	408.07	5.26	407.41	22.17	21.88	3.75
11,061.00	81.10	352.60	10,876.90	439.20	1.17	438.69	13.45	13.44	0.63
11,092.00	82.10	352.80	10,881.43	469.62	-2.73	469.26	3.29	3.23	0.65
11,123.00	82.70	353.20	10,885.53	500.12	-6.48	499.89	2.32	1.94	1.29
11,155.00	84.00	353.80	10,889.24	531.70	-10.07	531.61	4.47	4.06	1.88
11,186.00	85.70	354.70	10,892.02	562.41	-13.17	562.43	6.20	5.48	2.90
11,218.00	86.00	354.60	10,894.34	594.19	-16.14	594.31	0.99	0.94	-0.31
11,312.00	91.20	355.50	10,896.63	687.78	-24.25	688.17	5.61	5.53	0.96
11,407.00	94.70	355.50	10,891.74	782.35	-31.69	782.98	3.68	3.68	0.00
11,501.00	96.20	355.50	10,882.82	875.63	-39.03	876.50	1.60	1.60	0.00
11,596.00	94.80	355.90	10,873.71	969.92	-46.12	971.02	1.53	-1.47	0.42
11,659.00	94.00	356.00	10,868.88	1,032.58	-50.56	1,033.81	1.28	-1.27	0.16
11,690.00	92.80	355.40	10,867.04	1,063.44	-52.88	1,064.74	4.33	-3.87	-1.94
11,722.00	91.40	355.50	10,865.87	1,095.32	-55.41	1,096.70	4.39	-4.38	0.31
11,785.00	88.60	356.30	10,865.87	1,158.15	-59.92	1,159.67	4.62	-4.44	1.27
11,879.00	89.30	356.80	10,867.59	1,251.96	-65.57	1,253.65	0.92	0.74	0.53
11,974.00	90.70	356.50	10,867.59	1,346.80	-71.12	1,348.64	1.51	1.47	-0.32
12,068.00	90.20	356.10	10,866.85	1,440.60	-77.19	1,442.61	0.68	-0.53	-0.43
12,162.00	88.00	356.70	10,868.33	1,534.39	-83.09	1,536.58	2.43	-2.34	0.64
12,257.00	88.40	356.20	10,871.31	1,629.16	-88.97	1,631.52	0.67	0.42	-0.53
12,350.00	90.40	357.30	10,872.28	1,722.00	-94.24	1,724.51	2.45	2.15	1.18
12,445.00	90.90	357.20	10,871.21	1,816.89	-98.80	1,819.50	0.54	0.53	-0.11

Phoenix Technology Services LP

Survey Report

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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)
12,540.00	90.20	358.70	10,870.29	1,911.82	-102.20	1,914.49	1.74	-0.74	1.58
12,634.00	90.30	359.20	10,869.88	2,005.80	-103.92	2,008.45	0.54	0.11	0.53
12,729.00	91.40	359.40	10,868.48	2,100.78	-105.08	2,103.39	1.18	1.16	0.21
12,823.00	91.20	0.50	10,866.34	2,194.76	-105.16	2,197.27	1.19	-0.21	1.17
12,918.00	91.00	1.40	10,864.52	2,289.72	-103.59	2,292.07	0.97	-0.21	0.95
13,012.00	90.40	1.80	10,863.37	2,383.68	-100.96	2,385.81	0.77	-0.64	0.43
13,107.00	90.00	1.50	10,863.04	2,478.64	-98.23	2,480.54	0.53	-0.42	-0.32
13,201.00	90.70	0.60	10,862.46	2,572.62	-96.51	2,574.35	1.21	0.74	-0.96
13,295.00	90.90	359.40	10,861.15	2,666.61	-96.51	2,668.24	1.29	0.21	-1.28
13,390.00	91.70	358.40	10,859.00	2,761.57	-98.33	2,763.18	1.35	0.84	-1.05
13,484.00	90.90	358.80	10,856.86	2,855.51	-100.63	2,857.14	0.95	-0.85	0.43
13,578.00	90.80	358.00	10,855.47	2,949.47	-103.25	2,951.11	0.86	-0.11	-0.85
13,673.00	91.60	358.20	10,853.48	3,044.39	-106.40	3,046.08	0.87	0.84	0.21
13,767.00	92.30	357.70	10,850.28	3,138.28	-109.76	3,140.02	0.91	0.74	-0.53
13,862.00	91.40	358.40	10,847.21	3,233.17	-112.99	3,234.97	1.20	-0.95	0.74
13,956.00	91.40	356.70	10,844.92	3,327.05	-117.01	3,328.94	1.81	0.00	-1.81
14,051.00	90.20	355.40	10,843.59	3,421.81	-123.55	3,423.90	1.86	-1.26	-1.37
14,145.00	91.70	355.20	10,842.03	3,515.48	-131.25	3,517.82	1.61	1.60	-0.21
14,239.00	90.80	355.60	10,839.98	3,609.16	-138.79	3,611.74	1.05	-0.96	0.43
14,334.00	90.80	356.10	10,838.66	3,703.90	-145.66	3,706.69	0.53	0.00	0.53
14,428.00	90.40	356.60	10,837.67	3,797.70	-151.65	3,800.67	0.68	-0.43	0.53
14,523.00	90.10	357.10	10,837.26	3,892.56	-156.87	3,895.67	0.61	-0.32	0.53
14,618.00	91.20	356.10	10,836.18	3,987.38	-162.50	3,990.65	1.56	1.16	-1.05
14,712.00	90.60	356.20	10,834.70	4,081.16	-168.81	4,084.61	0.65	-0.64	0.11
14,807.00	90.10	356.90	10,834.12	4,175.98	-174.53	4,179.60	0.91	-0.53	0.74
14,901.00	89.10	357.20	10,834.78	4,269.85	-179.36	4,273.59	1.11	-1.06	0.32
14,996.00	90.60	356.20	10,835.03	4,364.69	-184.83	4,368.58	1.90	1.58	-1.05
15,090.00	90.10	356.20	10,834.45	4,458.48	-191.06	4,462.56	0.53	-0.53	0.00
15,145.00	90.10	356.20	10,834.36	4,513.36	-194.71	4,517.55	0.00	0.00	0.00
330' Hardline crossing									
15,185.00	90.10	356.20	10,834.29	4,553.27	-197.36	4,557.54	0.00	0.00	0.00
15,218.00	90.00	356.30	10,834.26	4,586.20	-199.52	4,590.53	0.43	-0.30	0.30
Last Phoenix MWD Survey									
15,275.00	90.00	356.30	10,834.26	4,643.08	-203.20	4,647.52	0.00	0.00	0.00
Projection to TD									

Phoenix Technology Services LP

Survey Report



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Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,090.00	10,088.31	-7.52	24.97	Tie In to Phoenix Gyro Surveys
10,178.00	10,176.29	-6.88	25.58	First Phoenix MWD Survey
15,145.00	10,834.36	4,513.36	-194.71	330' Hardline crossing
15,218.00	10,834.26	4,586.20	-199.52	Last Phoenix MWD Survey
15,275.00	10,834.26	4,643.08	-203.20	Projection to TD

Checked By: _____

Approved By: _____

Date: _____