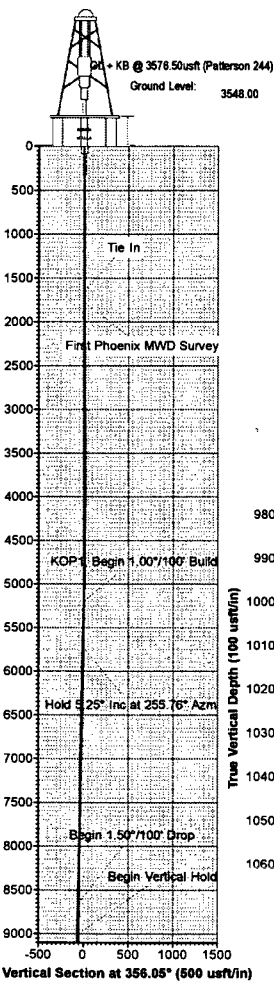




Project: Lea County, NM (NAD27)
Site: Grama Ridge State 8
Well: 3H
Wellbore: OH / Job #61593
Design: Plan 4 08-18-17
Rig: Patterson 244



Mag. Field Strength: 48234.9nT
Dip Angle: 60.30°
Date: 8/17/2017
Model: HDGM



WELL DETAILS						
+N-S	+E-W	Northing	Ground Level: Easting	3548.00	Latitude	Longitude
0.00	0.00	510000.00	761748.00	32° 23' 57.30344 N	103° 29' 7.03869 W	

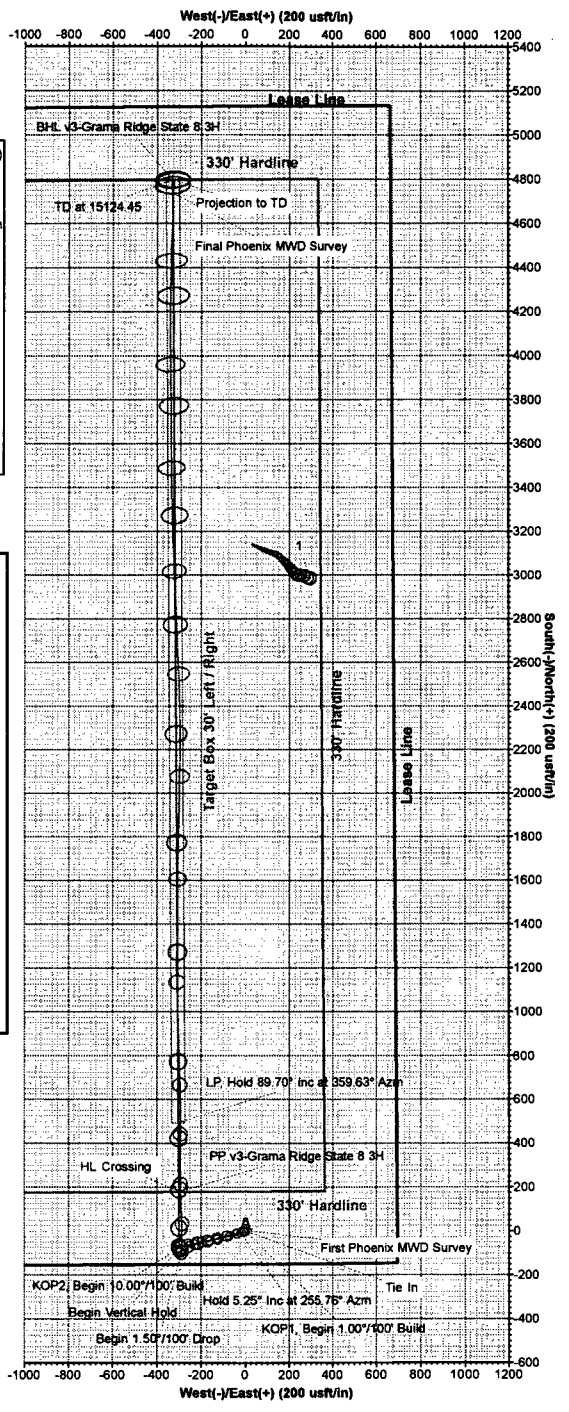
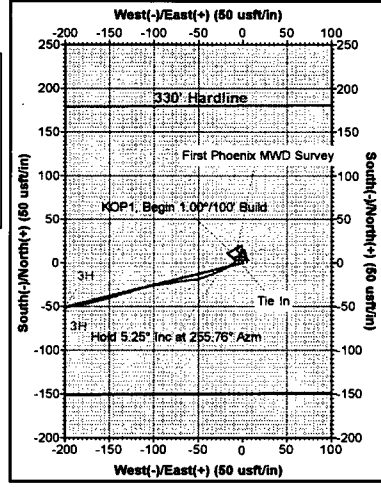
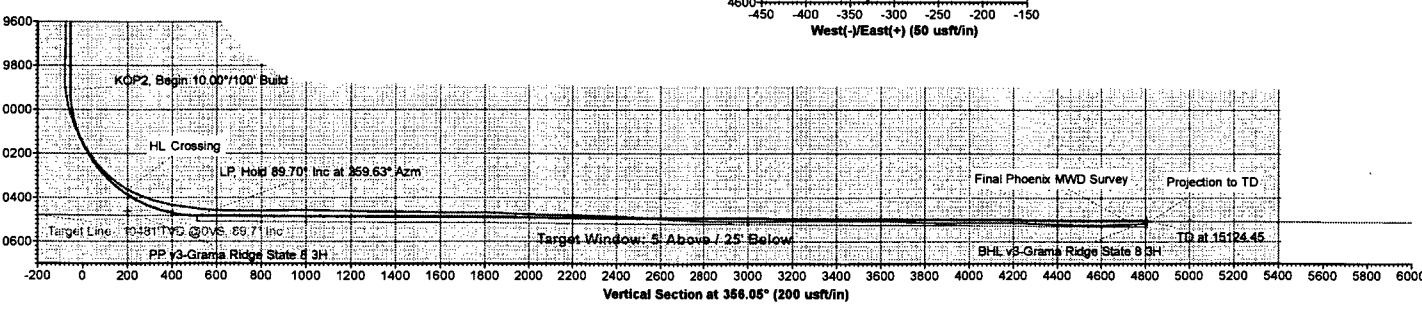
SECTION DETAILS											
MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSecl	Target	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
5200.00	0.00	0.00	5200.00	0.00	0.00	0.00	0.00	0.00	0.00		
5725.10	5.25	255.76	5724.38	-5.91	-23.31	1.00	255.76	-4.30		KOP1, Begin 1.00°/100' Build	
8663.49	5.25	255.76	8658.42	-72.06	-283.99	0.00	0.00	-52.34		Hold 5.25° Inc at 255.76° Azm	
9013.56	0.00	0.00	9000.00	-76.00	-298.50	1.50	180.00	-55.20		Begin 1.50°/100' Drop	
9924.25	0.00	0.00	9910.70	-76.00	-298.50	0.00	0.00	-55.20		Begin Vertical Hold	
10821.25	89.70	359.63	10483.65	493.95	-303.18	10.00	359.63	513.64		KOP2, Begin 10.00°/100' Build	
15124.45	89.70	359.63	10508.18	4797.00	-331.00	0.00	0.00	4808.41		LP, Hold 89.70° Inc at 359.63° Azm	
										TD at 15124.45	

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Site Grama Ridge State 8, Grid North
Latitude: 32° 23' 57.30344 N
Longitude: 103° 29' 7.03869 W
Grid East: 761748.00
Grid North: 510000.00
Scale Factor: 1.000
Geomagnetic Model: HDGM
Sample Date: 17-Aug-17
Magnetic Declination: 6.82°
Dip Angle from Horizontal: 60.30°
Magnetic Field Strength: 48235
To convert a Magnetic Direction to a Grid Direction, Add 6.36°
To convert a Magnetic Direction to a True Direction, Add 6.82° East
To convert a True Direction to a Grid Direction, Subtract 0.45°

DESIGN TARGET DETAILS							
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PP v3-Grama Ridge State 8 3H	10461.44	178.58	-301.38	510178.58	761446.64	32° 23' 59.09411 N	103° 29' 10.53688 W
BHL v3-Grama Ridge State 8 3H	10508.18	4797.00	-331.00	514797.00	761417.00	32° 24' 44.79578 N	103° 29' 10.45572 W

LEGEND

- 3H, OH / Job #61593, Surveys (Patterson 244) V0
- 1, OH, Surveys V0
- Plan 4 08-18-17





Marathon Oil EF LLC

Lea County, NM (NAD27 NME)

Grama Ridge State 8

3H

OH / Job #61593

Survey: Phoenix MWD Surveys

Standard Survey Report

22 August, 2017



Company:	Marathon Oil EF LLC	Local Co-ordinate Reference:	Site Grama Ridge State 8
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Site:	Grama Ridge State 8	MD Reference:	GL + KB @ 3576.50usft (Patterson 244)
Well:	3H	North Reference:	Grid
Wellbore:	OH / Job #61593	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	Database:	Compass 5000 GCR

Project	Lea County, NM (NAD27 NME)		
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	Grama Ridge State 8			
Site Position:		Northing:	510,000.00 usft	Latitude: 32° 23' 57.30344 N
From:	Map	Easting:	761,748.00 usft	Longitude: 103° 29' 7.03869 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.45 °

Well	3H			
Well Position	+N/-S	0.00 usft	Northing:	510,000.00 usft
	+E/-W	0.00 usft	Easting:	761,748.00 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft
			Ground Level:	3,548.00 usft

Wellbore	OH / Job #61593			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)
	HDGM	8/17/2017	6.82	60.30
				Field Strength (nT) 48,235

Design	Surveys (Patterson 244)			
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	356.05

Survey Program	Date 8/22/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
49.00	1,649.00	Gyro Surveys (OH / Job #61593)	NS-GYRO-MS	North sensing gyrocompassing m/s
1,783.00	15,108.00	Phoenix MWD Surveys (OH / Job #61593)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

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)
1,649.00	0.53	251.34	1,648.94	6.25	-7.91	6.78	0.00	0.00	0.00
Tie In									
1,783.00	0.19	41.29	1,782.94	6.21	-8.35	6.77	0.52	-0.25	111.90
First Phoenix MWD Survey									
1,880.00	0.31	100.71	1,879.93	6.29	-7.98	6.82	0.28	0.12	61.26
1,976.00	0.42	94.26	1,975.93	6.21	-7.38	6.71	0.12	0.11	-6.72
2,071.00	0.38	78.78	2,070.93	6.25	-6.72	6.70	0.12	-0.04	-16.29
2,167.00	0.67	58.91	2,166.93	6.60	-5.93	6.99	0.35	0.30	-20.70
2,262.00	0.68	60.62	2,261.92	7.16	-4.96	7.49	0.02	0.01	1.80

Company: Marathon Oil EF LLC
Project: Lea County, NM (NAD27 NME)
Site: Grama Ridge State 8
Well: 3H
Wellbore: OH / Job #61593
Design: Surveys (Patterson 244)

Local Co-ordinate Reference: Site Grama Ridge State 8
TVD Reference: GL + KB @ 3576.50usft (Patterson 244)
MD Reference: GL + KB @ 3576.50usft (Patterson 244)
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)
2,358.00	0.77	47.14	2,357.91	7.88	-3.99	8.14	0.20	0.09	-14.04
2,454.00	0.94	46.30	2,453.90	8.86	-2.95	9.05	0.18	0.18	-0.88
2,549.00	1.08	44.23	2,548.89	10.04	-1.76	10.14	0.15	0.15	-2.18
2,643.00	0.90	280.66	2,642.88	10.81	-1.87	10.92	1.86	-0.19	-131.46
2,738.00	1.13	293.90	2,737.86	11.33	-3.46	11.54	0.34	0.24	13.94
2,832.00	1.04	302.76	2,831.85	12.17	-5.02	12.49	0.20	-0.10	9.43
2,927.00	0.80	329.34	2,926.84	13.21	-6.09	13.59	0.51	-0.25	27.98
3,021.00	0.63	355.59	3,020.83	14.29	-6.46	14.70	0.39	-0.18	27.93
3,116.00	0.99	29.76	3,115.82	15.52	-6.09	15.90	0.62	0.38	35.97
3,210.00	1.11	41.44	3,209.80	16.91	-5.09	17.22	0.26	0.13	12.43
3,304.00	1.16	40.49	3,303.79	18.31	-3.87	18.54	0.06	0.05	-1.01
3,399.00	1.41	52.16	3,398.76	19.76	-2.32	19.87	0.38	0.26	12.28
3,494.00	0.35	147.44	3,493.75	20.23	-1.24	20.27	1.56	-1.12	100.29
3,589.00	0.92	189.09	3,588.75	19.24	-1.21	19.27	0.74	0.60	43.84
3,683.00	0.63	205.29	3,682.74	18.02	-1.55	18.09	0.38	-0.31	17.23
3,777.00	0.54	273.22	3,776.73	17.58	-2.21	17.69	0.70	-0.10	72.27
3,871.00	0.77	292.99	3,870.73	17.85	-3.23	18.03	0.34	0.24	21.03
3,965.00	1.14	312.78	3,964.71	18.73	-4.50	19.00	0.52	0.39	21.05
4,060.00	1.71	223.21	4,059.69	18.34	-6.17	18.72	2.16	0.60	-94.28
4,154.00	1.90	232.78	4,153.65	16.38	-8.37	16.92	0.38	0.20	10.18
4,249.00	1.95	233.52	4,248.59	14.47	-10.92	15.18	0.06	0.05	0.78
4,344.00	1.32	248.24	4,343.56	13.10	-13.24	13.98	0.79	-0.66	15.49
4,438.00	1.20	254.30	4,437.53	12.43	-15.19	13.45	0.19	-0.13	6.45
4,533.00	1.19	246.35	4,532.51	11.77	-17.05	12.91	0.17	-0.01	-8.37
4,628.00	0.88	130.43	4,627.50	10.90	-17.40	12.07	1.86	-0.33	-122.02
4,721.00	1.07	131.29	4,720.49	9.86	-16.20	10.95	0.20	0.20	0.92
4,815.00	1.11	123.54	4,814.47	8.78	-14.78	9.78	0.16	0.04	-8.24
4,910.00	1.06	137.06	4,909.46	7.63	-13.42	8.53	0.27	-0.05	14.23
5,004.00	1.22	132.89	5,003.44	6.31	-12.09	7.13	0.19	0.17	-4.44
5,099.00	1.39	127.43	5,098.41	4.92	-10.44	5.63	0.22	0.18	-5.75
5,131.00	1.37	127.21	5,130.40	4.45	-9.82	5.12	0.06	-0.06	-0.69
5,193.00	1.70	117.34	5,192.38	3.58	-8.42	4.15	0.68	0.53	-15.92
5,287.00	2.22	220.64	5,286.35	1.56	-8.36	2.13	3.29	0.55	109.89
5,382.00	3.56	232.13	5,381.23	-1.65	-11.89	-0.82	1.53	1.41	12.09
5,477.00	5.08	244.56	5,475.96	-5.26	-18.02	-4.01	1.87	1.60	13.08
5,571.00	4.82	242.81	5,569.61	-8.86	-25.29	-7.09	0.32	-0.28	-1.86
5,666.00	6.07	249.76	5,664.18	-12.42	-33.55	-10.08	1.49	1.32	7.32
5,761.00	5.83	245.81	5,758.66	-16.13	-42.67	-13.16	0.50	-0.25	-4.16
5,856.00	7.55	262.35	5,853.02	-18.94	-53.25	-15.23	2.70	1.81	17.41
5,950.00	7.21	262.33	5,946.24	-20.55	-65.22	-16.01	0.36	-0.36	-0.02
6,045.00	6.97	260.89	6,040.52	-22.26	-76.82	-16.92	0.31	-0.25	-1.52
6,139.00	7.19	260.85	6,133.80	-24.10	-88.26	-17.96	0.23	0.23	-0.04
6,233.00	7.34	261.21	6,227.05	-25.95	-100.00	-19.00	0.17	0.16	0.38

Company: Marathon Oil EF LLC
Project: Lea County, NM (NAD27 NME)
Site: Grama Ridge State 8
Well: 3H
Wellbore: OH / Job #61593
Design: Surveys (Patterson 244)

Local Co-ordinate Reference: Site Grama Ridge State 8
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MD Reference: GL + KB @ 3576.50usft (Patterson 244)
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)
6,327.00	6.02	253.50	6,320.41	-28.27	-110.66	-20.58	1.69	-1.40	-8.20
6,421.00	5.59	252.89	6,413.93	-31.01	-119.76	-22.70	0.46	-0.46	-0.65
6,515.00	5.24	254.14	6,507.51	-33.53	-128.27	-24.63	0.39	-0.37	1.33
6,609.00	4.97	252.90	6,601.13	-35.91	-136.29	-26.44	0.31	-0.29	-1.32
6,704.00	4.69	252.74	6,695.80	-38.27	-143.93	-28.27	0.30	-0.29	-0.17
6,798.00	4.41	253.60	6,789.50	-40.43	-151.07	-29.93	0.31	-0.30	0.91
6,893.00	4.08	256.13	6,884.24	-42.27	-157.85	-31.30	0.40	-0.35	2.66
6,987.00	4.29	255.95	6,977.99	-43.92	-164.51	-32.50	0.22	0.22	-0.19
7,081.00	3.79	252.04	7,071.75	-45.74	-170.88	-33.86	0.61	-0.53	-4.16
7,175.00	3.68	258.38	7,165.55	-47.30	-176.79	-35.02	0.45	-0.12	6.74
7,270.00	4.35	263.59	7,260.32	-48.32	-183.35	-35.58	0.80	0.71	5.48
7,364.00	4.82	259.66	7,354.02	-49.42	-190.78	-36.17	0.60	0.50	-4.18
7,458.00	4.26	261.24	7,447.73	-50.67	-198.12	-36.91	0.61	-0.60	1.68
7,552.00	3.38	261.33	7,541.52	-51.61	-204.31	-37.43	0.94	-0.94	0.10
7,646.00	4.49	259.20	7,635.29	-52.72	-210.66	-38.10	1.19	1.18	-2.27
7,740.00	3.98	250.71	7,729.04	-54.49	-217.35	-39.40	0.86	-0.54	-9.03
7,835.00	3.85	244.12	7,823.82	-56.97	-223.34	-41.46	0.49	-0.14	-6.94
7,929.00	3.46	236.95	7,917.62	-59.89	-228.55	-44.02	0.64	-0.41	-7.63
8,024.00	3.70	243.96	8,012.44	-62.80	-233.71	-46.57	0.52	0.25	7.38
8,118.00	3.94	258.46	8,106.23	-64.78	-239.60	-48.13	1.06	0.26	15.43
8,212.00	2.60	254.33	8,200.08	-66.00	-244.82	-48.99	1.45	-1.43	-4.39
8,307.00	4.67	241.84	8,294.88	-68.41	-250.30	-51.02	2.32	2.18	-13.15
8,401.00	4.32	239.40	8,388.59	-72.02	-256.72	-54.18	0.42	-0.37	-2.60
8,495.00	3.82	237.03	8,482.36	-75.53	-262.40	-57.28	0.56	-0.53	-2.52
8,589.00	5.41	250.31	8,576.05	-78.72	-269.20	-60.01	2.03	1.69	14.13
8,684.00	4.53	251.73	8,670.69	-81.41	-276.98	-62.15	0.94	-0.93	1.49
8,778.00	3.05	251.90	8,764.48	-83.35	-282.88	-63.68	1.57	-1.57	0.18
8,871.00	2.53	247.97	8,857.37	-84.89	-287.13	-64.92	0.60	-0.56	-4.23
8,966.00	1.75	245.86	8,952.31	-86.27	-290.40	-66.07	0.83	-0.82	-2.22
9,060.00	2.37	202.12	9,046.25	-88.65	-292.44	-68.31	1.74	0.66	-46.53
9,155.00	0.36	276.90	9,141.22	-90.44	-293.48	-70.02	2.42	-2.12	78.72
9,243.00	0.85	265.17	9,229.22	-90.46	-294.40	-69.98	0.57	0.56	-13.33
9,337.00	2.05	252.27	9,323.19	-91.03	-296.70	-70.39	1.31	1.28	-13.72
9,432.00	1.87	163.63	9,418.15	-93.04	-297.88	-72.31	2.89	-0.19	-93.31
9,527.00	1.52	127.79	9,513.11	-95.30	-296.45	-74.66	1.15	-0.37	-37.73
9,621.00	1.24	120.45	9,607.08	-96.57	-294.59	-76.07	0.35	-0.30	-7.81
9,715.00	1.45	124.13	9,701.06	-97.76	-292.72	-77.38	0.24	0.22	3.91
9,809.00	2.11	131.58	9,795.01	-99.57	-290.45	-79.34	0.74	0.70	7.93
9,857.00	1.19	137.19	9,842.99	-100.53	-289.45	-80.36	1.94	-1.92	11.69
9,904.00	4.03	353.68	9,889.96	-99.24	-289.30	-79.09	10.72	6.04	-305.34
9,950.00	9.02	3.70	9,935.65	-94.03	-289.24	-73.90	11.09	10.85	21.78
9,996.00	13.28	7.21	9,980.77	-85.19	-288.35	-65.14	9.37	9.26	7.63
10,043.00	17.81	0.52	10,026.04	-72.64	-287.60	-52.67	10.35	9.64	-14.23
10,090.00	20.40	355.10	10,070.45	-57.29	-288.24	-37.31	6.67	5.51	-11.53

Company: Marathon Oil EF LLC
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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)
10,137.00	25.50	358.92	10,113.72	-39.00	-289.13	-19.00	11.30	10.85	8.13
10,184.00	29.27	2.85	10,155.45	-17.40	-288.75	2.52	8.89	8.02	8.36
10,232.00	33.14	2.34	10,196.50	7.44	-287.63	27.23	8.08	8.06	-1.06
10,279.00	35.87	357.40	10,235.23	34.05	-287.73	53.77	8.31	5.81	-10.51
10,326.00	42.63	355.31	10,271.61	63.70	-289.66	83.49	14.65	14.38	-4.45
10,373.00	48.11	357.19	10,304.62	97.06	-291.82	116.92	12.00	11.66	4.00
10,420.00	54.30	359.45	10,334.05	133.66	-292.86	153.50	13.69	13.17	4.81
10,467.00	59.00	359.46	10,359.88	172.90	-293.23	192.68	10.00	10.00	0.02
10,474.00	59.87	359.39	10,363.44	178.93	-293.29	198.70	12.40	12.37	-0.98
HL Crossing									
10,515.00	64.94	359.01	10,382.43	215.25	-293.80	234.96	12.40	12.38	-0.93
10,562.00	69.82	359.56	10,400.50	258.62	-294.34	278.27	10.44	10.38	1.17
10,609.00	73.16	0.23	10,415.42	303.18	-294.42	322.73	7.23	7.11	1.43
10,657.00	77.67	0.00	10,427.50	349.62	-294.33	369.05	9.41	9.40	-0.48
10,704.00	80.56	0.66	10,436.38	395.77	-294.06	415.07	6.30	6.15	1.40
10,751.00	82.76	359.99	10,443.20	442.27	-293.80	461.44	4.89	4.68	-1.43
10,798.00	82.89	359.49	10,449.07	488.90	-294.01	507.98	1.09	0.28	-1.06
10,846.00	84.83	358.85	10,454.20	536.62	-294.70	555.63	4.25	4.04	-1.33
10,893.00	87.95	359.39	10,457.16	583.51	-295.42	602.46	6.74	6.64	1.15
10,940.00	88.30	359.27	10,458.70	630.48	-295.97	649.36	0.79	0.74	-0.26
10,975.00	88.66	357.85	10,459.62	665.46	-296.85	684.32	4.18	1.03	-4.06
11,069.00	91.17	357.38	10,459.76	759.37	-300.76	778.27	2.72	2.67	-0.50
11,163.00	90.67	359.11	10,458.25	853.31	-303.64	872.19	1.92	-0.53	1.84
11,257.00	89.97	359.02	10,457.73	947.30	-305.17	966.06	0.75	-0.74	-0.10
11,351.00	88.88	358.30	10,458.67	1,041.26	-307.37	1,059.95	1.39	-1.16	-0.77
11,445.00	88.54	358.90	10,460.79	1,135.21	-309.67	1,153.84	0.73	-0.36	0.64
11,539.00	88.18	0.36	10,463.48	1,229.17	-310.27	1,247.61	1.60	-0.38	1.55
11,633.00	89.89	1.03	10,465.06	1,323.14	-309.13	1,341.29	1.95	1.82	0.71
11,728.00	89.69	0.94	10,465.41	1,418.13	-307.50	1,435.93	0.23	-0.21	-0.09
11,822.00	88.57	0.38	10,466.84	1,512.11	-306.42	1,529.62	1.33	-1.19	-0.60
11,916.00	88.46	359.63	10,469.27	1,606.08	-306.41	1,623.36	0.81	-0.12	-0.80
12,010.00	91.20	0.37	10,469.55	1,700.07	-306.41	1,717.13	3.02	2.91	0.79
12,104.00	89.02	1.18	10,469.37	1,794.05	-305.14	1,810.80	2.47	-2.32	0.86
12,198.00	86.83	1.44	10,472.78	1,887.96	-302.99	1,904.34	2.35	-2.33	0.28
12,292.00	87.82	1.12	10,477.16	1,981.83	-300.89	1,997.85	1.11	1.05	-0.34
12,387.00	89.97	1.87	10,478.99	2,076.78	-298.41	2,092.39	2.40	2.26	0.79
12,481.00	88.57	0.72	10,480.19	2,170.74	-296.29	2,185.99	1.93	-1.49	-1.22
12,575.00	88.57	359.88	10,482.54	2,264.71	-295.80	2,279.70	0.89	0.00	-0.89
12,669.00	87.48	358.60	10,485.78	2,358.64	-297.04	2,373.50	1.79	-1.16	-1.36
12,764.00	87.90	357.62	10,489.61	2,453.51	-300.17	2,468.36	1.12	0.44	-1.03
12,858.00	86.33	357.85	10,494.34	2,547.32	-303.88	2,562.19	1.69	-1.67	0.24
12,952.00	86.38	357.82	10,500.31	2,641.06	-307.43	2,655.96	0.06	0.05	-0.03
13,046.00	87.28	357.65	10,505.51	2,734.84	-311.14	2,749.77	0.97	0.96	-0.18

Company: Marathon Oil EF LLC
Project: Lea County, NM (NAD27 NME)
Site: Grama Ridge State 8
Well: 3H
Wellbore: OH / Job #61593
Design: Surveys (Patterson 244)

Local Co-ordinate Reference: Site Grama Ridge State 8
TVD Reference: GL + KB @ 3576.50usft (Patterson 244)
MD Reference: GL + KB @ 3576.50usft (Patterson 244)
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)
13,140.00	88.80	357.55	10,508.73	2,828.70	-315.07	2,843.68	1.62	1.62	-0.11
13,235.00	89.58	357.99	10,510.07	2,923.62	-318.77	2,938.63	0.94	0.82	0.46
13,329.00	90.53	358.01	10,509.98	3,017.56	-322.05	3,032.57	1.01	1.01	0.02
13,423.00	91.04	357.46	10,508.69	3,111.48	-325.76	3,126.52	0.80	0.54	-0.59
13,517.00	91.93	358.29	10,506.26	3,205.38	-329.25	3,220.44	1.29	0.95	0.88
13,611.00	89.91	358.47	10,504.75	3,299.33	-331.90	3,314.35	2.16	-2.15	0.19
13,705.00	89.72	359.24	10,505.05	3,393.31	-333.78	3,408.23	0.84	-0.20	0.82
13,800.00	88.82	359.76	10,506.26	3,488.29	-334.61	3,503.05	1.09	-0.95	0.55
13,895.00	89.97	359.44	10,507.26	3,583.28	-335.27	3,597.86	1.26	1.21	-0.34
13,989.00	87.65	359.30	10,509.22	3,677.25	-336.31	3,691.68	2.47	-2.47	-0.15
14,083.00	87.62	359.31	10,513.09	3,771.16	-337.45	3,785.45	0.03	-0.03	0.01
14,177.00	89.55	358.67	10,515.42	3,865.12	-339.10	3,879.29	2.16	2.05	-0.68
14,272.00	91.29	358.92	10,514.72	3,960.09	-341.10	3,974.18	1.85	1.83	0.26
14,366.00	90.14	0.08	10,513.55	4,054.07	-341.92	4,068.00	1.74	-1.22	1.23
14,461.00	89.52	0.20	10,513.83	4,149.07	-341.69	4,162.75	0.66	-0.65	0.13
14,555.00	87.82	1.02	10,516.01	4,243.04	-340.69	4,256.43	2.01	-1.81	0.87
14,649.00	87.79	1.61	10,519.61	4,336.94	-338.53	4,349.96	0.63	-0.03	0.63
14,743.00	88.16	1.32	10,522.93	4,430.85	-336.13	4,443.48	0.50	0.39	-0.31
14,838.00	89.16	1.85	10,525.15	4,525.79	-333.50	4,538.01	1.19	1.05	0.56
14,932.00	91.04	1.94	10,524.99	4,619.74	-330.40	4,631.52	2.00	2.00	0.10
15,026.00	93.05	1.65	10,521.64	4,713.62	-327.45	4,724.98	2.16	2.14	-0.31
15,048.00	93.50	1.78	10,520.38	4,735.58	-326.80	4,746.84	2.13	2.05	0.59
Final Phoenix MWD Survey									
15,108.00	93.50	1.78	10,516.72	4,795.44	-324.94	4,806.43	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
1,649.00	1,648.94	6.25	-7.91	Tie In
1,783.00	1,782.94	6.21	-8.35	First Phoenix MWD Survey
10,474.00	10,363.44	178.93	-293.29	HL Crossing
15,048.00	10,520.38	4,735.58	-326.80	Final Phoenix MWD Survey
15,108.00	10,516.72	4,795.44	-324.94	Projection to TD