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Directional Survey**

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DISTRICT II-ARTESIA O.C.D.

Marathon Oil Permian, LLC

Eddy County, NM (NAD27)

Red Light

27-34 State Com 23 26 27 TB #14H

30.015 - 44490

OH

Survey: SDI Survey #1

Standard Survey Report

02 January, 2018



Scientific Drilling

www.scientificdrilling.com

Survey Report

Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Red Light
Well: 27-34 State Com 23 26 27 TB #14H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 TB #14H
TVD Reference: KB = 26.5 @ 3311.50usft (H&P 441)
MD Reference: KB = 26.5 @ 3311.50usft (H&P 441)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland District

Project	Eddy 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		Using geodetic scale factor

Site	Red Light		
Site Position:		Northing:	466,229.90 usft
From:	Map	Easting:	518,227.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 54.368 N
		Longitude:	104° 16' 27.667 W
		Grid Convergence:	0.03 °

Well	27-34 State Com 23 26 27 TB #14H		
Well Position	+N/-S	0.00 usft	Northing: 466,229.90 usft
	+E/-W	0.00 usft	Easting: 518,227.80 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 16' 54.368 N
		Longitude:	104° 16' 27.084 W
		Ground Level:	3,285.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	10/5/2017	7.45
		Dip Angle (°)	60.00
		Field Strength (nT)	48,031

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
		Direction (bearing)	180.11
		Tie On Depth:	0.00

Survey Program	Date	12/29/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
170.00	15,038.00	SDI Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	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	
170.00	1.39	160.79	169.98	-1.95	0.68	1.95	0.82	0.82	0.00	
230.00	1.17	169.80	229.97	-3.24	1.03	3.24	0.50	-0.37	15.02	
320.00	1.01	175.94	319.95	-4.93	1.25	4.93	0.22	-0.18	6.82	
412.00	1.08	164.27	411.94	-6.58	1.54	6.57	0.24	0.08	-12.68	
595.00	0.62	147.69	594.92	-9.07	2.53	9.07	0.28	-0.25	-9.06	
685.00	0.67	126.65	684.91	-9.80	3.22	9.79	0.27	0.06	-23.38	
777.00	1.06	104.82	776.90	-10.34	4.47	10.33	0.55	0.42	-23.73	
868.00	2.18	107.73	867.86	-11.08	6.93	11.07	1.23	1.23	3.20	
959.00	1.95	96.71	958.80	-11.79	10.12	11.77	0.50	-0.25	-12.11	

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Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,048.00	1.01	91.09	1,047.77	-11.98	12.41	11.96	1.07	-1.06	-6.31
1,143.00	0.61	36.10	1,142.76	-11.59	13.54	11.56	0.87	-0.42	-57.88
1,237.00	1.64	331.09	1,236.75	-10.01	13.19	9.98	1.58	1.10	-69.16
1,332.00	2.47	311.23	1,331.69	-7.47	10.99	7.44	1.14	0.87	-20.91
1,426.00	2.25	294.31	1,425.61	-5.37	7.79	5.36	0.77	-0.23	-18.00
1,521.00	3.30	290.73	1,520.50	-3.64	3.53	3.63	1.12	1.11	-3.77
1,615.00	3.60	295.13	1,614.33	-1.42	-1.67	1.43	0.43	0.32	4.68
1,710.00	3.65	290.70	1,709.14	0.91	-7.20	-0.90	0.30	0.05	-4.66
1,804.00	3.40	288.58	1,802.96	2.86	-12.64	-2.83	0.30	-0.27	-2.26
1,899.00	3.51	291.89	1,897.79	4.84	-18.01	-4.80	0.24	0.12	3.48
2,089.00	3.75	297.36	2,087.40	9.86	-28.93	-9.81	0.22	0.13	2.88
2,184.00	3.86	297.79	2,182.20	12.78	-34.52	-12.71	0.12	0.12	0.45
2,278.00	3.48	305.71	2,276.00	15.92	-39.63	-15.85	0.67	-0.40	8.43
2,373.00	3.36	321.81	2,370.84	19.79	-43.69	-19.71	1.02	-0.13	16.95
2,467.00	3.13	318.33	2,464.69	23.87	-47.10	-23.78	0.32	-0.24	-3.70
2,562.00	3.21	320.87	2,559.54	27.88	-50.51	-27.78	0.17	0.08	2.67
2,657.00	3.62	326.38	2,654.37	32.44	-53.84	-32.33	0.55	0.43	5.80
2,751.00	3.51	323.87	2,748.19	37.23	-57.18	-37.12	0.20	-0.12	-2.67
2,846.00	3.46	324.85	2,843.01	41.92	-60.55	-41.81	0.08	-0.05	1.03
2,941.00	3.34	324.71	2,937.85	46.53	-63.80	-46.40	0.13	-0.13	-0.15
3,035.00	3.43	315.96	3,031.68	50.78	-67.34	-50.65	0.56	0.10	-9.31
3,130.00	3.22	310.03	3,126.52	54.54	-71.35	-54.40	0.42	-0.22	-6.24
3,224.00	3.41	317.81	3,220.37	58.31	-75.25	-58.17	0.52	0.20	8.28
3,319.00	4.01	332.91	3,315.17	63.36	-78.66	-63.21	1.20	0.63	15.89
3,414.00	3.69	330.82	3,409.96	68.99	-81.67	-68.83	0.37	-0.34	-2.20
3,508.00	3.31	327.41	3,503.78	73.92	-84.60	-73.75	0.46	-0.40	-3.63
3,603.00	2.94	312.74	3,598.64	77.88	-87.87	-77.71	0.92	-0.39	-15.44
3,698.00	2.97	314.57	3,693.51	81.26	-91.41	-81.09	0.10	0.03	1.93
3,793.00	3.65	326.26	3,788.36	85.50	-94.84	-85.32	1.01	0.72	12.31
3,887.00	3.29	325.47	3,882.18	90.21	-98.04	-90.02	0.39	-0.38	-0.84
3,982.00	2.99	320.45	3,977.04	94.37	-101.16	-94.17	0.43	-0.32	-5.28
4,077.00	2.69	309.82	4,071.92	97.71	-104.45	-97.51	0.64	-0.32	-11.19
4,172.00	2.81	316.33	4,166.82	100.82	-107.77	-100.61	0.35	0.13	6.85
4,266.00	3.58	327.59	4,260.67	104.96	-110.93	-104.75	1.05	0.82	11.98
4,361.00	3.00	328.58	4,355.51	109.59	-113.82	-109.37	0.61	-0.61	1.04
4,456.00	2.74	326.54	4,450.39	113.60	-116.37	-113.38	0.29	-0.27	-2.15
4,551.00	2.96	331.36	4,545.28	117.65	-118.79	-117.42	0.34	0.23	5.07
4,646.00	3.59	332.83	4,640.12	122.45	-121.33	-122.22	0.67	0.66	1.55
4,740.00	2.92	338.70	4,733.97	127.30	-123.54	-127.06	0.80	-0.71	6.24
4,835.00	2.61	340.76	4,828.86	131.60	-125.13	-131.36	0.34	-0.33	2.17
4,929.00	2.40	317.59	4,922.77	135.07	-127.17	-134.83	1.09	-0.22	-24.65
5,024.00	2.78	299.65	5,017.67	137.68	-130.51	-137.43	0.94	0.40	-18.88
5,119.00	2.14	293.88	5,112.59	139.54	-134.13	-139.28	0.72	-0.67	-6.07
5,213.00	2.78	302.33	5,206.50	141.47	-137.66	-141.20	0.78	0.68	8.99

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5,308.00	3.02	307.93	5,301.38	144.24	-141.58	-143.96	0.39	0.25	5.89
5,403.00	2.24	308.27	5,396.28	146.92	-145.02	-146.65	0.82	-0.82	0.36
5,498.00	2.95	305.42	5,491.18	149.49	-148.47	-149.21	0.76	0.75	-3.00
5,593.00	3.66	304.94	5,586.02	152.64	-152.94	-152.35	0.75	0.75	-0.51
5,688.00	3.73	301.59	5,680.82	156.00	-158.06	-155.70	0.24	0.07	-3.53
5,783.00	3.19	291.69	5,775.65	158.60	-163.15	-158.28	0.85	-0.57	-10.42
5,877.00	3.06	304.44	5,869.51	160.98	-167.65	-160.66	0.75	-0.14	13.56
5,972.00	2.95	326.21	5,964.38	164.45	-171.10	-164.12	1.20	-0.12	22.92
6,067.00	2.85	332.88	6,059.26	168.58	-173.54	-168.25	0.37	-0.11	7.02
6,161.00	3.67	328.01	6,153.11	173.21	-176.20	-172.87	0.92	0.87	-5.18
6,256.00	3.56	327.37	6,247.92	178.28	-179.40	-177.93	0.12	-0.12	-0.67
6,351.00	3.20	322.48	6,342.76	182.86	-182.60	-182.51	0.49	-0.38	-5.15
6,445.00	2.83	311.83	6,436.63	186.49	-185.93	-186.13	0.71	-0.39	-11.33
6,540.00	3.14	320.84	6,531.50	190.07	-189.32	-189.71	0.59	0.33	9.48
6,634.00	3.24	324.84	6,625.35	194.24	-192.48	-193.87	0.26	0.11	4.26
6,729.00	2.82	324.02	6,720.22	198.33	-195.39	-197.95	0.44	-0.44	-0.86
6,824.00	2.27	325.32	6,815.13	201.76	-197.84	-201.38	0.58	-0.58	1.37
6,918.00	2.80	321.75	6,909.03	205.10	-200.32	-204.71	0.59	0.56	-3.80
7,013.00	2.67	324.15	7,003.92	208.71	-203.05	-208.32	0.18	-0.14	2.53
7,108.00	2.86	324.08	7,098.81	212.43	-205.74	-212.03	0.20	0.20	-0.07
7,202.00	2.68	323.00	7,192.70	216.08	-208.44	-215.68	0.20	-0.19	-1.15
7,296.00	3.43	321.93	7,286.57	220.05	-211.49	-219.64	0.80	0.80	-1.14
7,391.00	3.02	315.14	7,381.42	224.06	-215.01	-223.65	0.59	-0.43	-7.15
7,486.00	3.07	327.05	7,476.29	227.97	-218.16	-227.55	0.67	0.05	12.54
7,580.00	1.41	336.51	7,570.21	231.14	-219.99	-230.72	1.80	-1.77	10.06
7,675.00	0.69	4.40	7,665.20	232.79	-220.41	-232.36	0.91	-0.76	29.36
7,770.00	0.58	62.75	7,760.19	233.58	-219.94	-233.15	0.66	-0.12	61.42
7,865.00	0.98	100.43	7,855.18	233.65	-218.71	-233.23	0.66	0.42	39.66
7,951.00	1.40	117.78	7,941.16	233.03	-217.06	-232.61	0.64	0.49	20.17
7,983.00	3.49	154.44	7,973.13	231.97	-216.29	-231.55	7.84	6.53	114.56
8,015.00	5.67	169.75	8,005.03	229.53	-215.59	-229.12	7.75	6.81	47.84
8,046.00	9.15	179.23	8,035.77	225.56	-215.29	-225.14	11.86	11.23	30.58
8,078.00	13.43	183.06	8,067.14	219.30	-215.45	-218.89	13.57	13.38	11.97
8,109.00	16.80	187.33	8,097.07	211.26	-216.21	-210.84	11.44	10.87	13.77
8,141.00	20.30	187.77	8,127.40	201.17	-217.56	-200.75	10.95	10.94	1.38
8,188.00	25.93	187.70	8,170.61	182.89	-220.04	-182.47	11.98	11.98	-0.15
8,236.00	31.82	185.04	8,212.63	159.87	-222.56	-159.44	12.56	12.27	-5.54
8,283.00	36.63	183.80	8,251.48	133.52	-224.58	-133.09	10.34	10.23	-2.64
8,330.00	40.60	183.02	8,288.19	104.24	-226.31	-103.81	8.51	8.45	-1.66
8,377.00	45.53	182.32	8,322.52	72.20	-227.80	-71.76	10.54	10.49	-1.49
8,425.00	48.44	183.94	8,355.26	37.16	-229.72	-36.72	6.55	6.06	3.38
8,472.00	51.41	183.52	8,385.52	1.27	-232.06	-0.83	6.36	6.32	-0.89
8,523.00	54.15	183.50	8,416.36	-39.26	-234.55	39.71	5.37	5.37	-0.04

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8,570.00	57.16	183.08	8,442.88	-78.00	-236.77	78.45	6.45	6.40	-0.89
8,618.00	59.81	182.58	8,467.96	-118.86	-238.79	119.32	5.59	5.52	-1.04
8,618.31	59.83	182.58	8,468.12	-119.13	-238.80	119.58	5.25	5.17	-1.09
FTP[RL27-34-14H]									
8,665.00	62.24	182.08	8,490.73	-159.94	-240.46	160.40	5.25	5.17	-1.06
8,712.00	65.56	182.31	8,511.40	-202.11	-242.08	202.58	7.08	7.06	0.49
8,759.00	68.32	181.92	8,529.81	-245.32	-243.67	245.79	5.92	5.87	-0.83
8,807.00	71.23	181.82	8,546.41	-290.33	-245.14	290.80	6.07	6.06	-0.21
8,854.00	72.54	181.14	8,561.02	-334.99	-246.29	335.46	3.11	2.79	-1.45
8,902.00	75.78	180.81	8,574.12	-381.15	-247.08	381.63	6.78	6.75	-0.69
8,949.00	79.30	181.60	8,584.26	-427.03	-248.04	427.50	7.67	7.49	1.68
8,996.00	81.00	182.14	8,592.30	-473.31	-249.56	473.79	3.79	3.62	1.15
9,043.00	84.32	183.26	8,598.30	-519.87	-251.75	520.35	7.45	7.06	2.38
9,091.00	89.46	183.77	8,600.90	-567.69	-254.69	568.18	10.76	10.71	1.06
9,186.00	91.68	183.73	8,599.96	-662.47	-260.90	662.97	2.34	2.34	-0.04
9,280.00	90.44	183.65	8,598.22	-756.26	-266.95	756.77	1.32	-1.32	-0.09
9,375.00	89.13	181.71	8,598.58	-851.15	-271.39	851.67	2.46	-1.38	-2.04
9,470.00	89.63	181.68	8,599.61	-946.10	-274.20	946.63	0.53	0.53	-0.03
9,565.00	91.01	181.95	8,599.07	-1,041.05	-277.21	1,041.58	1.48	1.45	0.28
9,660.00	91.21	179.45	8,597.23	-1,136.02	-278.37	1,136.55	2.64	0.21	-2.63
9,755.00	92.49	179.16	8,594.17	-1,230.96	-277.22	1,231.49	1.38	1.35	-0.31
9,849.00	90.60	179.09	8,591.63	-1,324.91	-275.79	1,325.44	2.01	-2.01	-0.07
9,944.00	91.34	179.69	8,590.02	-1,419.89	-274.77	1,420.42	1.00	0.78	0.63
10,039.00	90.03	179.38	8,588.89	-1,514.88	-274.00	1,515.40	1.42	-1.38	-0.33
10,134.00	91.45	179.44	8,587.66	-1,609.86	-273.03	1,610.38	1.50	1.49	0.06
10,228.00	90.34	178.78	8,586.19	-1,703.84	-271.57	1,704.36	1.37	-1.18	-0.70
10,323.00	91.55	179.08	8,584.63	-1,798.81	-269.79	1,799.32	1.31	1.27	0.32
10,418.00	90.67	178.73	8,582.79	-1,893.77	-267.98	1,894.28	1.00	-0.93	-0.37
10,512.00	91.41	178.61	8,581.08	-1,987.73	-265.80	1,988.24	0.80	0.79	-0.13
10,607.00	89.56	179.92	8,580.28	-2,082.71	-264.58	2,083.22	2.39	-1.95	1.38
10,701.00	90.64	179.65	8,580.11	-2,176.71	-264.22	2,177.21	1.18	1.15	-0.29
10,796.00	91.95	179.07	8,577.97	-2,271.68	-263.16	2,272.18	1.51	1.38	-0.61
10,890.00	90.81	179.25	8,575.70	-2,365.64	-261.79	2,366.14	1.23	-1.21	0.19
10,984.00	89.23	180.59	8,575.67	-2,459.63	-261.65	2,460.13	2.20	-1.68	1.43
11,079.00	90.17	181.45	8,576.17	-2,554.61	-263.35	2,555.12	1.34	0.99	0.91
11,173.00	89.09	181.08	8,576.77	-2,648.59	-265.42	2,649.09	1.21	-1.15	-0.39
11,268.00	89.40	181.46	8,578.03	-2,743.56	-267.53	2,744.06	0.52	0.33	0.40
11,362.00	91.28	181.27	8,577.47	-2,837.52	-269.77	2,838.04	2.01	2.00	-0.20
11,456.00	90.03	181.71	8,576.39	-2,931.48	-272.21	2,932.00	1.41	-1.33	0.47
11,550.00	88.86	180.72	8,577.30	-3,025.46	-274.20	3,025.98	1.63	-1.24	-1.05
11,645.00	90.24	180.32	8,578.05	-3,120.45	-275.06	3,120.97	1.51	1.45	-0.42
11,739.00	89.23	180.22	8,578.48	-3,214.44	-275.51	3,214.97	1.08	-1.07	-0.11
11,833.00	91.01	180.39	8,578.29	-3,308.44	-276.01	3,308.96	1.90	1.89	0.18
11,928.00	90.84	179.82	8,576.75	-3,403.42	-276.18	3,403.95	0.63	-0.18	-0.60

Survey Report

Company: Marathon Oil Permian, LLC
 Project: Eddy County, NM (NAD27)
 Site: Red Light
 Well: 27-34 State Com 23 26 27 TB #14H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 TB #14H
 TVD Reference: KB = 26.5 @ 3311.50usft (H&P 441)
 MD Reference: KB = 26.5 @ 3311.50usft (H&P 441)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,022.00	89.46	180.29	8,576.51	-3,497.42	-276.27	3,497.95	1.55	-1.47	0.50
12,116.00	87.38	179.51	8,579.10	-3,591.38	-276.11	3,591.90	2.36	-2.21	-0.83
12,211.00	89.60	180.00	8,581.60	-3,686.34	-275.70	3,686.86	2.39	2.34	0.52
12,305.00	89.13	179.21	8,582.64	-3,780.33	-275.05	3,780.85	0.98	-0.50	-0.84
12,400.00	91.21	179.62	8,582.36	-3,875.32	-274.08	3,875.84	2.23	2.19	0.43
12,494.00	90.77	178.94	8,580.74	-3,969.30	-272.90	3,969.81	0.86	-0.47	-0.72
12,588.00	87.89	178.17	8,581.84	-4,063.25	-270.53	4,063.76	3.17	-3.06	-0.82
12,683.00	89.56	177.62	8,583.95	-4,158.16	-267.05	4,158.66	1.85	1.76	-0.58
12,777.00	89.83	179.40	8,584.45	-4,252.12	-264.60	4,252.62	1.92	0.29	1.89
12,802.00	90.07	179.30	8,584.47	-4,277.12	-264.32	4,277.62	1.04	0.96	-0.40
12,897.00	90.30	179.67	8,584.17	-4,372.12	-263.46	4,372.61	0.46	0.24	0.39
12,991.00	89.09	180.93	8,584.67	-4,466.11	-263.96	4,466.61	1.86	-1.29	1.34
13,086.00	89.60	181.25	8,585.75	-4,561.09	-265.76	4,561.59	0.63	0.54	0.34
13,179.00	89.03	182.26	8,586.86	-4,654.03	-268.61	4,654.54	1.25	-0.61	1.09
13,274.00	87.85	181.88	8,589.45	-4,748.93	-272.04	4,749.45	1.30	-1.24	-0.40
13,368.00	88.52	181.09	8,592.43	-4,842.85	-274.48	4,843.37	1.10	0.71	-0.84
13,463.00	89.97	181.82	8,593.68	-4,937.81	-276.89	4,938.34	1.71	1.53	0.77
13,558.00	89.19	181.15	8,594.38	-5,032.78	-279.35	5,033.30	1.08	-0.82	-0.71
13,652.00	90.71	180.68	8,594.46	-5,126.76	-280.85	5,127.29	1.69	1.62	-0.50
13,747.00	90.10	180.75	8,593.79	-5,221.75	-282.04	5,222.28	0.65	-0.64	0.07
13,841.00	89.70	180.14	8,593.95	-5,315.75	-282.77	5,316.28	0.78	-0.43	-0.65
13,936.00	89.03	179.42	8,595.00	-5,410.74	-282.40	5,411.27	1.04	-0.71	-0.76
14,031.00	89.90	178.68	8,595.89	-5,505.72	-280.83	5,506.25	1.20	0.92	-0.78
14,125.00	88.09	178.77	8,597.54	-5,599.68	-278.74	5,600.20	1.93	-1.93	0.10
14,220.00	88.29	178.92	8,600.54	-5,694.61	-276.82	5,695.13	0.26	0.21	0.16
14,315.00	89.29	178.66	8,602.55	-5,789.57	-274.82	5,790.09	1.09	1.05	-0.27
14,409.00	90.13	178.98	8,603.02	-5,883.55	-272.88	5,884.06	0.96	0.89	0.34
14,504.00	90.07	180.06	8,602.86	-5,978.54	-272.08	5,979.05	1.14	-0.06	1.14
14,598.00	91.08	180.06	8,601.91	-6,072.54	-272.18	6,073.05	1.07	1.07	0.00
14,693.00	89.50	181.06	8,601.43	-6,167.53	-273.11	6,168.04	1.97	-1.66	1.05
14,787.00	89.43	181.89	8,602.31	-6,261.49	-275.53	6,262.01	0.89	-0.07	0.88
14,882.00	90.30	182.05	8,602.53	-6,356.43	-278.80	6,356.96	0.93	0.92	0.17
14,976.00	88.39	183.67	8,603.61	-6,450.30	-283.49	6,450.84	2.66	-2.03	1.72
15,071.00	87.82	182.68	8,606.75	-6,545.10	-288.74	6,545.65	1.20	-0.60	-1.04
15,166.00	86.84	181.28	8,611.18	-6,639.94	-292.02	6,640.49	1.80	-1.03	-1.47
15,260.00	88.62	180.88	8,614.90	-6,733.85	-293.79	6,734.40	1.94	1.89	-0.43
15,355.00	89.50	180.62	8,616.46	-6,828.82	-295.04	6,829.38	0.97	0.93	-0.27
15,449.00	90.57	180.16	8,616.40	-6,922.82	-295.68	6,923.37	1.24	1.14	-0.49
15,544.00	91.71	179.70	8,614.51	-7,017.80	-295.56	7,018.35	1.29	1.20	-0.48
15,638.00	91.92	179.53	8,611.53	-7,111.75	-294.93	7,112.30	0.29	0.22	-0.18
15,733.00	91.14	179.89	8,609.00	-7,206.71	-294.45	7,207.27	0.90	-0.82	0.38
15,801.00	91.34	179.74	8,607.52	-7,274.70	-294.23	7,275.25	0.37	0.29	-0.22

FINAL MWD Survey (15801.00' MD)

Survey Report

Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Red Light
Well: 27-34 State Com 23 26 27 TB #14H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 TB #14H
TVD Reference: KB = 26.5 @ 3311.50usft (H&P 441)
MD Reference: KB = 26.5 @ 3311.50usft (H&P 441)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,863.00	91.34	179.74	8,606.07	-7,336.68	-293.95	7,337.23	0.00	0.00	0.00
FINAL Proj. to Bit (15863.00' MD) - BHL[RL27-34-14H]									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
15,801.00	8,607.52	-7,274.70	-294.23	FINAL MWD Survey (15801.00' MD)
15,863.00	8,606.07	-7,336.68	-293.95	FINAL Proj. to Bit (15863.00' MD)

Checked By: _____ Approved By: _____ Date: _____



EDDY COUNTY, NM (NAD27)
RED LIGHT
27-34 STATE COM 23 26 27 TB #14H
FINAL AS-DRILLED
H&P 441

WELL DETAILS:

Ground Level: 3285.00
+N-S +E-W Northing Easting Latitude Longitude
0.00 0.00 466229.90 518277.80 32° 16' 54.368 N 04° 16' 27.084 W

SECTION DETAILS

NO	NC	AZ	TO	+N-S	+E-W	QLEG	TFACE	VECT	TARGE
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
999.50	0.00	0.00	999.50	0.00	0.00	0.00	0.00	0.00	0.00
34.50	2.40	3.50	34.44	2.42	-2.41	2.00	3.50	-7.42	
160.30	2.40	3.50	160.33	2.36	-2.35	0.00	0.00	-230.14	
85.50	0.00	0.00	85.50	-131.00	-220.02	0.00	0.00	131.53	
59.532	0.00	0.00	59.532	-1337.2	-271.03	0.00	0.00	733.62	BH[RL27-34-14H]



To convert Magnetic North to Grid, Add 7.42°
To convert True North to Grid, Subtract 0.03°

Azimuths to Grid North
True North: -0.03°
Magnetic North: 7.42°
Magnetic Field
Strength: 48031.0snT
Dip Angle: 60.00°
Date: 10/5/2017
Model: HDGM

DRILLING TARGET: 8574' TVD @ OVS // 89.8° INC.

TARGET WINDOW: 10' UP // 10' DOWN

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting
BH[RL27-34-14H]	8600.00	-7337.11	-272.70	458683.45	518005.12
FTP[RL27-34-14H]	8616.26	-35.10	-256.84	466184.60	518016.96

SITE DETAILS: RED LIGHT
SITE CENTRE NORTHING: 466229.90
EASTING: 518277.80
POSITIONAL UNCERTAINTY: 0.00
CONVERGENCE: 0.03
LOCAL NORTH: GRID

PROJECT DETAILS: EDDY COUNTY, NM (NAD27)
GEODETIC SYSTEM: US STATE PLANE 1927 (EXACT SOLUTION)
DATUM: NAD 1927 (NADCON CONUS)
ELLIPSOID: CLARKE 1866
ZONE: NEW MEXICO EAST 3001
SYSTEM DATUM: MEAN SEA LEVEL

FORMATION TOP DETAILS

NO FORMATION DATA IS AVAILABLE

MAP SYSTEM: US STATE PLANE 1927 (EXACT SOLUTION)
DATUM: NAD 1927 (NADCON CONUS)
ELLIPSOID: CLARKE 1866
ZONE: NEW MEXICO EAST 3001

LOCAL ORIGIN: WELL 27-34 STATE COM 23 26 27 TB #14H, GRID NORTH

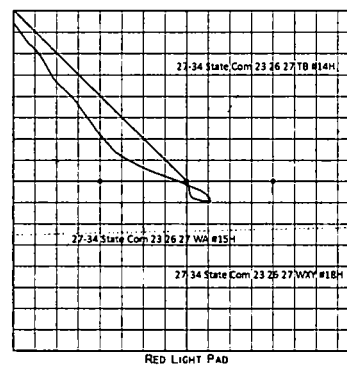
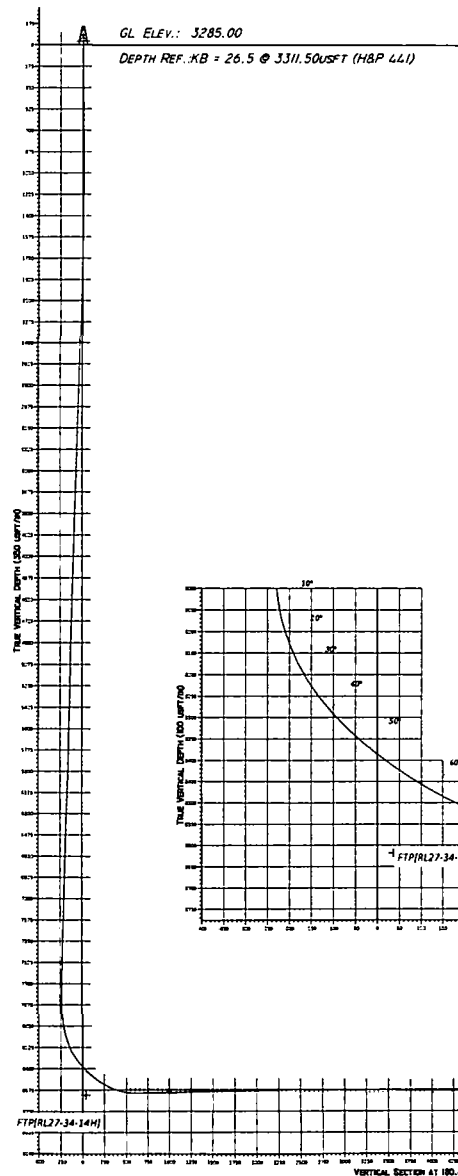
LATITUDE: 32° 16' 54.368 N
LONGITUDE: 104° 16' 27.084 W

GRID EAST: 518277.80
GRID NORTH: 466229.90
SCALE FACTOR: 1.000

GEOMAGNETIC MODEL: HDGM
SAMPLE DATE: 05-01-17
MAGNETIC DECLINATION: 7.42°
DIP ANGLE FROM HORIZONTAL: 60.00°
MAGNETIC FIELD STRENGTH: 48031
TO CONVERT MAGNETIC NORTH TO GRID, ADD 7.42°
TO CONVERT MAGNETIC NORTH TO TRUE, ADD 7.42° E-131
TO CONVERT TRUE NORTH TO GRID, SUBTRACT 0.03°

CASING DETAILS

No casing data is available



Scientific Drilling

