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Directional Survey

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DISTRICT II-ARTESIA O.C.

Marathon Oil Permian, LLC

Eddy County, NM (NAD27)

Red Light

27-34 State Com 23 26 27 WXY #18H

30-015-44492

OH

Survey: SDI Survey #1

Standard Survey Report

01 February, 2018



www.scientificdrilling.com

Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well 27-34 State Com 23 26 27 WXY #18H
Project:	Eddy County, NM (NAD27)	TVD Reference:	KB = 26.5' @ 3310.50usft (H&P 441)
Site:	Red Light	MD Reference:	KB = 26.5' @ 3310.50usft (H&P 441)
Well:	27-34 State Com 23 26 27 WXY #18H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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 WXY #18H		
Well Position	+N/-S	0.00 usft	Northing: 466,229.90 usft
	+E/-W	0.00 usft	Easting: 518,327.80 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 16' 54.368 N
		Longitude:	104° 16' 26.502 W
		Ground Level:	3,284.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	10/4/2017	7.45
		Dip Angle (°)	60.00
		Field Strength (nT)	48,031

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
		Direction (bearing)	180.22

Survey Program	Date 2/1/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
170.00	16,019.00	SDI Survey #1 (OH)	MWD+HDGM
			Description
			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	1.04	122.70	169.99	-0.83	1.30	0.83	0.61	0.61	0.00
230.00	0.89	137.64	229.98	-1.47	2.07	1.46	0.49	-0.25	24.90
320.00	1.17	127.28	319.97	-2.55	3.27	2.53	0.37	0.31	-11.51
412.00	0.95	152.49	411.95	-3.79	4.37	3.77	0.55	-0.24	27.40
504.00	0.74	135.76	503.94	-4.89	5.14	4.87	0.35	-0.23	-18.18
595.00	0.95	118.90	594.93	-5.68	6.21	5.65	0.36	0.23	-18.53
686.00	1.26	112.33	685.92	-6.42	7.80	6.39	0.37	0.34	-7.22
777.00	1.84	87.66	776.88	-6.74	10.18	6.70	0.96	0.64	-27.11
868.00	2.31	90.90	867.82	-6.71	13.47	6.66	0.53	0.52	3.56

Survey Report

Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Red Light
Well: 27-34 State Com 23 26 27 WXY #18H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 WXY #18H
TVD Reference: KB = 26.5' @ 3310.50usft (H&P 441)
MD Reference: KB = 26.5' @ 3310.50usft (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)
958.00	2.53	80.60	957.74	-6.42	17.25	6.35	0.54	0.24	-11.44
1,048.00	2.99	68.14	1,047.64	-5.22	21.39	5.14	0.84	0.51	-13.84
1,139.00	2.12	53.96	1,138.55	-3.34	24.95	3.25	1.17	-0.96	-15.58
1,233.00	1.98	67.94	1,232.49	-1.71	27.86	1.60	0.55	-0.15	14.87
1,328.00	3.44	79.75	1,327.38	-0.59	32.19	0.46	1.64	1.54	12.43
1,423.00	2.93	68.24	1,422.24	0.82	37.25	-0.96	0.86	-0.54	-12.12
1,518.00	3.21	32.74	1,517.11	3.96	40.94	-4.11	1.99	0.29	-37.37
1,612.00	3.43	23.62	1,610.95	8.75	43.49	-8.91	0.61	0.23	-9.70
1,707.00	3.16	25.57	1,705.79	13.71	45.76	-13.89	0.31	-0.28	2.05
1,802.00	2.90	22.15	1,800.66	18.30	47.79	-18.48	0.33	-0.27	-3.60
1,897.00	2.68	25.14	1,895.55	22.54	49.64	-22.73	0.28	-0.23	3.15
2,023.00	2.37	17.50	2,021.43	27.69	51.68	-27.89	0.36	-0.25	-6.06
2,086.00	2.35	17.64	2,084.37	30.16	52.46	-30.36	0.03	-0.03	0.22
2,181.00	2.77	46.17	2,179.28	33.61	54.71	-33.82	1.40	0.44	30.03
2,275.00	3.14	58.58	2,273.16	36.52	58.54	-36.75	0.78	0.39	13.20
2,370.00	3.00	58.11	2,368.02	39.19	62.88	-39.43	0.15	-0.15	-0.49
2,465.00	2.80	54.65	2,462.90	41.85	66.88	-42.11	0.28	-0.21	-3.64
2,559.00	3.52	51.69	2,556.75	44.97	71.02	-45.24	0.79	0.77	-3.15
2,654.00	4.07	49.72	2,651.55	48.95	75.88	-49.24	0.59	0.58	-2.07
2,749.00	3.79	49.52	2,746.32	53.17	80.84	-53.48	0.30	-0.29	-0.21
2,843.00	3.92	47.95	2,840.11	57.34	85.59	-57.67	0.18	0.14	-1.67
2,938.00	3.93	48.70	2,934.89	61.66	90.44	-62.01	0.06	0.01	0.79
3,033.00	4.16	48.49	3,029.65	66.10	95.47	-66.46	0.24	0.24	-0.22
3,128.00	3.97	46.57	3,124.41	70.64	100.44	-71.03	0.25	-0.20	-2.02
3,222.00	3.75	47.48	3,218.20	74.96	105.07	-75.36	0.24	-0.23	0.97
3,317.00	3.77	46.29	3,312.99	79.21	109.61	-79.63	0.08	0.02	-1.25
3,412.00	3.28	67.97	3,407.82	82.39	114.39	-82.83	1.48	-0.52	22.82
3,507.00	3.52	74.01	3,502.65	84.21	119.71	-84.67	0.45	0.25	6.36
3,602.00	2.82	74.56	3,597.51	85.64	124.77	-86.12	0.74	-0.74	0.58
3,696.00	3.85	61.66	3,691.35	87.75	129.78	-88.25	1.35	1.10	-13.72
3,791.00	4.20	56.52	3,786.11	91.19	135.48	-91.71	0.53	0.37	-5.41
3,886.00	4.26	57.17	3,880.85	95.02	141.35	-95.56	0.08	0.06	0.68
3,981.00	4.04	56.35	3,975.60	98.79	147.10	-99.35	0.24	-0.23	-0.86
4,075.00	3.64	57.69	4,069.39	102.21	152.38	-102.80	0.44	-0.43	1.43
4,170.00	3.38	56.09	4,164.21	105.39	157.25	-105.99	0.29	-0.27	-1.68
4,264.00	3.22	60.97	4,258.06	108.22	161.86	-108.84	0.34	-0.17	5.19
4,359.00	3.67	57.24	4,352.89	111.16	166.75	-111.80	0.53	0.47	-3.93
4,453.00	3.88	58.28	4,446.68	114.46	171.99	-115.12	0.23	0.22	1.11
4,547.00	3.80	58.80	4,540.47	117.74	177.36	-118.42	0.09	-0.09	0.55
4,642.00	3.87	57.02	4,635.26	121.12	182.74	-121.82	0.15	0.07	-1.87
4,736.00	3.70	57.33	4,729.05	124.48	187.95	-125.20	0.18	-0.18	0.33
4,831.00	3.53	56.40	4,823.87	127.75	192.97	-128.49	0.19	-0.18	-0.98
4,925.00	4.26	56.44	4,917.65	131.29	198.29	-132.05	0.78	0.78	0.04
5,019.00	4.35	56.27	5,011.38	135.20	204.16	-135.98	0.10	0.10	-0.18

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Wellbore: OH
Design: OH

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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)
5,114.00	4.68	55.64	5,106.09	139.38	210.36	-140.19	0.35	0.35	-0.66
5,208.00	3.92	65.65	5,199.82	142.87	216.45	-143.70	1.13	-0.81	10.65
5,302.00	3.73	50.58	5,293.62	146.14	221.74	-146.99	1.09	-0.20	-16.03
5,397.00	3.89	47.32	5,388.41	150.29	226.50	-151.15	0.28	0.17	-3.43
5,491.00	3.60	47.09	5,482.21	154.46	231.00	-155.34	0.31	-0.31	-0.24
5,585.00	2.21	38.90	5,576.08	157.88	234.30	-158.78	1.54	-1.48	-8.71
5,679.00	2.35	43.39	5,670.01	160.69	236.76	-161.60	0.24	0.15	4.78
5,774.00	4.20	32.47	5,764.85	165.04	239.97	-165.96	2.05	1.95	-11.49
5,868.00	4.62	44.27	5,858.57	170.65	244.46	-171.59	1.06	0.45	12.55
5,963.00	3.76	37.52	5,953.32	175.86	249.03	-176.82	1.04	-0.91	-7.11
6,057.00	3.61	35.84	6,047.12	180.71	252.64	-181.68	0.20	-0.16	-1.79
6,151.00	3.31	56.41	6,140.96	184.61	256.63	-185.59	1.35	-0.32	21.88
6,246.00	3.78	69.03	6,235.78	187.25	261.84	-188.25	0.96	0.49	13.28
6,340.00	2.80	64.75	6,329.62	189.33	266.81	-190.36	1.07	-1.04	-4.55
6,434.00	3.69	63.75	6,423.47	191.65	271.60	-192.69	0.95	0.95	-1.06
6,529.00	3.02	57.54	6,518.31	194.35	276.45	-195.41	0.80	-0.71	-6.54
6,623.00	2.94	54.96	6,612.18	197.06	280.52	-198.14	0.17	-0.09	-2.74
6,718.00	4.35	60.56	6,706.98	200.23	285.65	-201.33	1.53	1.48	5.89
6,811.00	3.62	56.02	6,799.76	203.60	291.16	-204.72	0.85	-0.78	-4.88
6,906.00	2.93	50.94	6,894.60	206.81	295.53	-207.94	0.79	-0.73	-5.35
7,000.00	3.69	40.86	6,988.45	210.61	299.37	-211.76	1.02	0.81	-10.72
7,095.00	3.45	36.75	7,083.26	215.21	303.08	-216.38	0.37	-0.25	-4.33
7,190.00	3.00	27.19	7,178.11	219.72	305.93	-220.89	0.74	-0.47	-10.06
7,284.00	3.61	32.30	7,271.96	224.41	308.63	-225.59	0.72	0.65	5.44
7,379.00	2.61	40.75	7,366.82	228.57	311.64	-229.77	1.16	-1.05	8.89
7,474.00	3.59	42.43	7,461.68	232.41	315.06	-233.61	1.04	1.03	1.77
7,568.00	3.90	59.45	7,555.48	236.20	319.80	-237.43	1.22	0.33	18.11
7,663.00	3.05	50.68	7,650.30	239.45	324.54	-240.69	1.05	-0.89	-9.23
7,757.00	2.61	61.15	7,744.19	242.06	328.35	-243.32	0.72	-0.47	11.14
7,852.00	1.35	115.71	7,839.14	242.62	331.25	-243.89	2.24	-1.33	57.43
7,947.00	2.00	154.64	7,934.10	240.64	332.97	-241.92	1.34	0.68	40.98
8,042.00	1.76	157.41	8,029.05	237.79	334.24	-239.08	0.27	-0.25	2.92
8,136.00	4.50	166.52	8,122.90	232.87	335.65	-234.16	2.95	2.91	9.69
8,183.00	9.85	168.62	8,169.51	227.14	336.88	-228.43	11.39	11.38	4.47
8,231.00	15.08	170.30	8,216.37	216.95	338.74	-218.25	10.92	10.90	3.50
8,278.00	19.87	172.72	8,261.18	202.99	340.79	-204.30	10.31	10.19	5.15
8,326.00	23.48	172.52	8,305.78	185.41	343.06	-186.73	7.52	7.52	-0.42
8,373.00	27.46	173.54	8,348.21	165.35	345.50	-166.68	8.52	8.47	2.17
8,420.00	31.92	175.32	8,389.03	142.19	347.74	-143.52	9.67	9.49	3.79
8,468.00	36.08	176.30	8,428.81	115.43	349.69	-116.77	8.74	8.67	2.04
8,515.00	39.89	177.85	8,465.85	86.54	351.15	-87.89	8.36	8.11	3.30
8,562.00	43.41	177.75	8,500.96	55.34	352.35	-56.69	7.49	7.49	-0.21
8,609.00	46.91	176.33	8,534.10	22.06	354.08	-23.42	7.75	7.45	-3.02

Survey Report

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 Project: Eddy County, NM (NAD27)
 Site: Red Light
 Well: 27-34 State Com 23 26 27 WXY #18H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 WXY #18H
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8,657.00	50.68	175.75	8,565.72	-13.96	356.58	12.59	7.91	7.85	-1.21
8,704.00	53.68	176.01	8,594.53	-50.98	359.24	49.60	6.40	6.38	0.55
8,746.79	56.68	177.20	8,618.96	-86.04	361.32	84.66	7.38	7.02	2.78
FTP[RL27-34-18H]									
8,751.00	56.98	177.31	8,621.27	-89.57	361.49	88.18	7.38	7.03	2.67
8,798.00	61.42	179.07	8,645.33	-129.91	362.75	128.51	9.98	9.45	3.74
8,846.00	65.17	180.29	8,666.89	-172.78	362.98	171.38	8.14	7.81	2.54
8,893.00	68.34	181.13	8,685.44	-215.95	362.44	214.56	6.94	6.74	1.79
8,940.00	71.43	181.61	8,701.60	-260.07	361.38	258.68	6.64	6.57	1.02
8,988.00	74.64	181.26	8,715.61	-305.96	360.23	304.57	6.72	6.69	-0.73
9,035.00	79.34	178.97	8,726.19	-351.73	360.15	350.35	11.07	10.00	-4.87
9,058.00	81.68	178.74	8,729.98	-374.41	360.60	373.03	10.22	10.17	-1.00
9,215.00	87.82	178.15	8,744.34	-530.62	364.85	529.22	3.93	3.91	-0.38
9,310.00	88.52	178.15	8,747.37	-625.52	367.91	624.11	0.74	0.74	0.00
9,405.00	89.93	177.05	8,748.66	-720.43	371.89	718.99	1.88	1.48	-1.16
9,499.00	90.10	176.98	8,748.63	-814.30	376.79	812.85	0.20	0.18	-0.07
9,594.00	90.07	176.62	8,748.49	-909.15	382.09	907.68	0.38	-0.03	-0.38
9,688.00	91.81	177.59	8,746.95	-1,003.01	386.84	1,001.52	2.12	1.85	1.03
9,784.00	92.31	180.00	8,743.50	-1,098.92	388.85	1,097.42	2.56	0.52	2.51
9,878.00	89.87	181.71	8,741.71	-1,192.89	387.45	1,191.39	3.17	-2.60	1.82
9,973.00	88.99	181.61	8,742.65	-1,287.84	384.70	1,286.35	0.93	-0.93	-0.11
10,068.00	90.07	180.85	8,743.43	-1,382.81	382.66	1,381.33	1.39	1.14	-0.80
10,162.00	90.00	180.65	8,743.38	-1,476.81	381.43	1,475.33	0.23	-0.07	-0.21
10,256.00	92.02	181.18	8,741.72	-1,570.77	379.93	1,569.30	2.22	2.15	0.56
10,351.00	90.67	178.90	8,739.49	-1,665.74	379.86	1,664.27	2.79	-1.42	-2.40
10,445.00	90.50	176.59	8,738.53	-1,759.65	383.56	1,758.17	2.46	-0.18	-2.46
10,539.00	92.62	178.40	8,735.97	-1,853.52	387.67	1,852.02	2.96	2.26	1.93
10,634.00	91.58	180.36	8,732.49	-1,948.45	388.70	1,946.94	2.33	-1.09	2.06
10,729.00	88.08	179.70	8,732.77	-2,043.43	388.65	2,041.92	3.75	-3.68	-0.69
10,823.00	90.44	181.53	8,733.98	-2,137.41	387.64	2,135.90	3.18	2.51	1.95
10,918.00	91.04	182.28	8,732.76	-2,232.34	384.48	2,230.85	1.01	0.63	0.79
11,012.00	90.17	181.65	8,731.77	-2,326.28	381.26	2,324.80	1.14	-0.93	-0.67
11,107.00	93.70	182.80	8,728.56	-2,421.14	377.57	2,419.67	3.91	3.72	1.21
11,202.00	91.51	183.53	8,724.24	-2,515.89	372.33	2,514.44	2.43	-2.31	0.77
11,296.00	90.40	184.04	8,722.67	-2,609.67	366.13	2,608.25	1.30	-1.18	0.54
11,391.00	90.23	181.57	8,722.15	-2,704.55	361.48	2,703.14	2.61	-0.18	-2.60
11,486.00	90.74	181.84	8,721.35	-2,799.50	358.65	2,798.10	0.61	0.54	0.28
11,580.00	87.32	182.24	8,722.94	-2,893.42	355.31	2,892.03	3.66	-3.64	0.43
11,675.00	87.51	180.85	8,727.22	-2,988.28	352.75	2,986.91	1.48	0.20	-1.46
11,768.00	91.78	181.38	8,727.80	-3,081.24	350.94	3,079.87	4.63	4.59	0.57
11,862.00	89.63	180.43	8,726.64	-3,175.21	349.46	3,173.85	2.50	-2.29	-1.01
11,957.00	87.62	180.80	8,728.92	-3,270.18	348.44	3,268.81	2.15	-2.12	0.39
12,051.00	89.66	179.41	8,731.15	-3,364.14	348.26	3,362.78	2.63	2.17	-1.48
12,145.00	91.28	179.34	8,730.38	-3,458.13	349.29	3,456.76	1.73	1.72	-0.07

Survey Report

Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Red Light
Well: 27-34 State Com 23 26 27 WXY #18H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 WXY #18H
TVD Reference: KB = 26.5' @ 3310.50usft (H&P 441)
MD Reference: KB = 26.5' @ 3310.50usft (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)
12,240.00	90.67	180.00	8,728.77	-3,553.11	349.84	3,551.75	0.95	-0.64	0.69
12,334.00	89.09	179.62	8,728.96	-3,647.11	350.15	3,645.74	1.73	-1.68	-0.40
12,429.00	91.27	180.08	8,728.66	-3,742.10	350.40	3,740.73	2.35	2.29	0.48
12,524.00	88.19	179.93	8,729.11	-3,837.09	350.39	3,835.72	3.25	-3.24	-0.16
12,618.00	90.17	180.30	8,730.46	-3,931.08	350.20	3,929.70	2.14	2.11	0.39
12,713.00	89.09	180.13	8,731.07	-4,026.07	349.84	4,024.70	1.15	-1.14	-0.18
12,808.00	91.71	181.81	8,730.41	-4,121.05	348.24	4,119.68	3.28	2.76	1.77
12,902.00	89.46	180.32	8,729.45	-4,215.02	346.49	4,213.65	2.87	-2.39	-1.59
12,997.00	91.85	181.04	8,728.36	-4,310.00	345.36	4,308.64	2.63	2.52	0.76
13,092.00	88.59	179.97	8,728.00	-4,404.98	344.52	4,403.62	3.61	-3.43	-1.13
13,187.00	88.66	179.79	8,730.28	-4,499.95	344.72	4,498.59	0.20	0.07	-0.19
13,282.00	91.88	181.46	8,729.83	-4,594.93	343.69	4,593.57	3.82	3.39	1.76
13,376.00	88.63	181.36	8,729.41	-4,688.88	341.38	4,687.54	3.46	-3.46	-0.11
13,471.00	89.23	181.99	8,731.18	-4,783.83	338.60	4,782.49	0.92	0.63	0.66
13,566.00	92.21	182.38	8,729.99	-4,878.74	334.98	4,877.42	3.16	3.14	0.41
13,661.00	88.56	181.91	8,729.35	-4,973.65	331.42	4,972.34	3.87	-3.84	-0.49
13,756.00	89.80	180.77	8,730.71	-5,068.61	329.20	5,067.31	1.77	1.31	-1.20
13,850.00	91.38	179.18	8,729.74	-5,162.60	329.24	5,161.30	2.38	1.68	-1.69
13,945.00	89.97	179.51	8,728.62	-5,257.59	330.33	5,256.28	1.52	-1.48	0.35
14,039.00	87.51	178.76	8,730.69	-5,351.55	331.75	5,350.23	2.74	-2.62	-0.80
14,133.00	90.03	179.90	8,732.71	-5,445.51	332.84	5,444.19	2.94	2.68	1.21
14,228.00	89.87	178.98	8,732.79	-5,540.50	333.77	5,539.18	0.98	-0.17	-0.97
14,323.00	89.09	178.80	8,733.65	-5,635.48	335.61	5,634.15	0.84	-0.82	-0.19
14,417.00	92.79	180.11	8,732.11	-5,729.45	336.51	5,728.11	4.18	3.94	1.39
14,512.00	90.13	180.55	8,729.69	-5,824.41	335.96	5,823.07	2.84	-2.80	0.46
14,606.00	88.39	180.06	8,730.91	-5,918.39	335.46	5,917.06	1.92	-1.85	-0.52
14,700.00	88.29	179.95	8,733.63	-6,012.35	335.45	6,011.02	0.16	-0.11	-0.12
14,794.00	88.96	179.88	8,735.88	-6,106.33	335.59	6,104.99	0.72	0.71	-0.07
14,889.00	88.36	180.17	8,738.11	-6,201.30	335.55	6,199.96	0.70	-0.63	0.31
14,983.00	91.41	180.54	8,738.29	-6,295.29	334.97	6,293.95	3.27	3.24	0.39
15,077.00	89.03	179.98	8,737.93	-6,389.28	334.54	6,387.94	2.60	-2.53	-0.60
15,172.00	89.50	179.82	8,739.15	-6,484.27	334.71	6,482.94	0.52	0.49	-0.17
15,266.00	91.75	181.29	8,738.13	-6,578.25	333.80	6,576.92	2.86	2.39	1.56
15,361.00	90.30	180.85	8,736.43	-6,673.22	332.02	6,671.89	1.60	-1.53	-0.46
15,455.00	88.02	180.31	8,737.81	-6,767.19	331.07	6,765.87	2.49	-2.43	-0.57
15,549.00	90.60	182.62	8,738.94	-6,861.14	328.67	6,859.83	3.68	2.74	2.46
15,644.00	90.84	183.08	8,737.74	-6,956.02	323.95	6,954.72	0.55	0.25	0.48
15,738.00	91.07	182.48	8,736.18	-7,049.89	319.39	7,048.61	0.68	0.24	-0.64
15,833.00	90.47	182.09	8,734.90	-7,144.81	315.60	7,143.54	0.75	-0.63	-0.41
15,927.00	93.23	183.70	8,731.87	-7,238.63	310.86	7,237.38	3.40	2.94	1.71
15,957.00	93.19	183.64	8,730.19	-7,268.52	308.94	7,267.28	0.24	-0.13	-0.20
FINAL MWD Survey (15266.00' MD)									
16,015.77	93.19	183.64	8,726.92	-7,327.07	305.21	7,325.85	0.00	0.00	0.00

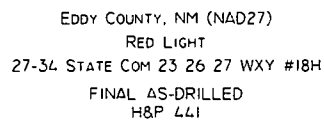
Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well 27-34 State Com 23 26 27 WXY #18H
Project:	Eddy County, NM (NAD27)	TVD Reference:	KB = 26.5' @ 3310.50usft (H&P 441)
Site:	Red Light	MD Reference:	KB = 26.5' @ 3310.50usft (H&P 441)
Well:	27-34 State Com 23 26 27 WXY #18H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)
BHL[RL27-34-18H]									
16,019.00	93.19	183.64	8,726.74	-7,330.30	305.01	7,329.07	0.00	0.00	0.00
FINAL Proj. to Bit (16019.00' MD)									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
15,957.00	8,730.19	-7,268.52	308.94	FINAL MWD Survey (15266.00' MD)
16,019.00	8,726.74	-7,330.30	305.01	FINAL Proj. to Bit (16019.00' MD)

Checked By: _____ Approved By: _____ Date: _____



		GROUND LEVEL:		3284.00	
+N/-S	+E/-W	NORTHING	EASTING	LATITUDE	LONGITUDE
0.00	0.00	466279.90	518327.80	32° 16' 54.368 N	04° 16' 26.502 W

DATE	TIME	LOCATION	WIND	WAVE	SEA	WAVE	SEA	WAVE	SEA
1971	10:00	104.5	10	10	10	10	10	10	10
1971	10:30	104.5	10	10	10	10	10	10	10
1971	11:00	104.5	10	10	10	10	10	10	10
1971	11:30	104.5	10	10	10	10	10	10	10
1971	12:00	104.5	10	10	10	10	10	10	10
1971	12:30	104.5	10	10	10	10	10	10	10
1971	13:00	104.5	10	10	10	10	10	10	10
1971	13:30	104.5	10	10	10	10	10	10	10
1971	14:00	104.5	10	10	10	10	10	10	10
1971	14:30	104.5	10	10	10	10	10	10	10
1971	15:00	104.5	10	10	10	10	10	10	10
1971	15:30	104.5	10	10	10	10	10	10	10
1971	16:00	104.5	10	10	10	10	10	10	10
1971	16:30	104.5	10	10	10	10	10	10	10
1971	17:00	104.5	10	10	10	10	10	10	10
1971	17:30	104.5	10	10	10	10	10	10	10
1971	18:00	104.5	10	10	10	10	10	10	10
1971	18:30	104.5	10	10	10	10	10	10	10
1971	19:00	104.5	10	10	10	10	10	10	10
1971	19:30	104.5	10	10	10	10	10	10	10
1971	20:00	104.5	10	10	10	10	10	10	10
1971	20:30	104.5	10	10	10	10	10	10	10
1971	21:00	104.5	10	10	10	10	10	10	10
1971	21:30	104.5	10	10	10	10	10	10	10
1971	22:00	104.5	10	10	10	10	10	10	10
1971	22:30	104.5	10	10	10	10	10	10	10
1971	23:00	104.5	10	10	10	10	10	10	10
1971	23:30	104.5	10	10	10	10	10	10	10
1971	00:00	104.5	10	10	10	10	10	10	10
1971	00:30	104.5	10	10	10	10	10	10	10
1971	01:00	104.5	10	10	10	10	10	10	10
1971	01:30	104.5	10	10	10	10	10	10	10
1971	02:00	104.5	10	10	10	10	10	10	10
1971	02:30	104.5	10	10	10	10	10	10	10
1971	03:00	104.5	10	10	10	10	10	10	10
1971	03:30	104.5	10	10	10	10	10	10	10
1971	04:00	104.5	10	10	10	10	10	10	10
1971	04:30	104.5	10	10	10	10	10	10	10
1971	05:00	104.5	10	10	10	10	10	10	10
1971	05:30	104.5	10	10	10	10	10	10	10
1971	06:00	104.5	10	10	10	10	10	10	10
1971	06:30	104.5	10	10	10	10	10	10	10
1971									

Name	TVD	+N/-S	+E/-W	Northing	Easting
FTP[RL27-34-18H]	8713.50	-19.80	373.99	466210.10	518701.76
BHJ[RL27-34-18H]	8746.00	-7330.72	345.83	458899.84	518673.60

Magnetic Field
Strength: 48031.2snT
Dip Angle: 60.00°
Date: 10/4/2017
Model: HDGM

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

DEPTH REF.: K9 = 26.5' @ 3310.50 USFT (H&P 441)

DRILLING TARGET: 8720' @ C/S // 89.8° INC.

TARGET WINDOW: 15' UP // 15' DOWN

SITE CENTRE NORTHING: 466229.90
EASTING: 518227.80

POSITIONAL UNCERTAINTY: 0.00
CONVERGENCE: 0.03
LOCAL NORTH: GRID

PROJECT DETAILS: EDDY COUNTY, NM (NAD27)
GEODETIC SYSTEM: US STATE PLANE 1927 (EXACT SOLUTION)

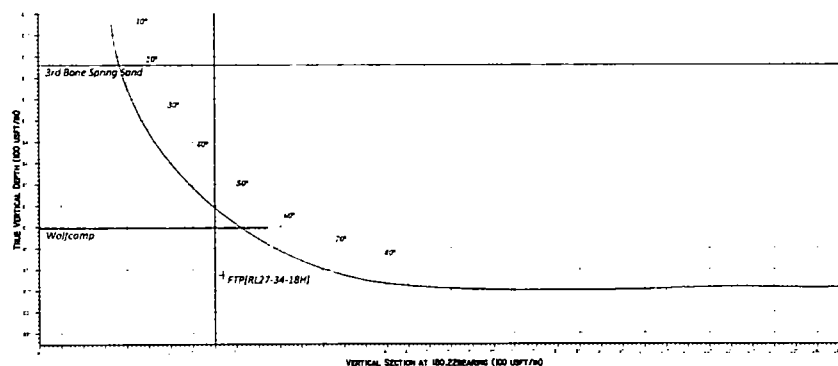
DATUM: NAD 1927 (NADCON CONUS)

ELLIPSOID: CLARKE 1866

ZONE: NEW MEXICO EAST 3001

SYSTEM DATUM: MEAN SEA LEVEL

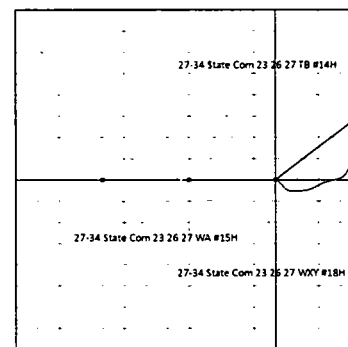
TVOPATH	MDPATH	FORMATION
555.50	555.50	CATTLE
1543.50	1543.50	BASE OF SALT
	174.4	LAMAR
1915.50	1916.14	BELL CANYON
2605.50	2605.66	CHERRY CANYON
3608.50	3612.87	BURGHY CANYON
5217.50	5225.42	BONE SPRING
617.50	6187.53	1ST BONE SPRING SAND
6545.50	6556.34	2ND BONE SPRING SAND
8220.50	8235.15	3RD BONE SPRING SAND
8602.50	8688.48	WOLFCAMP

[illegible]

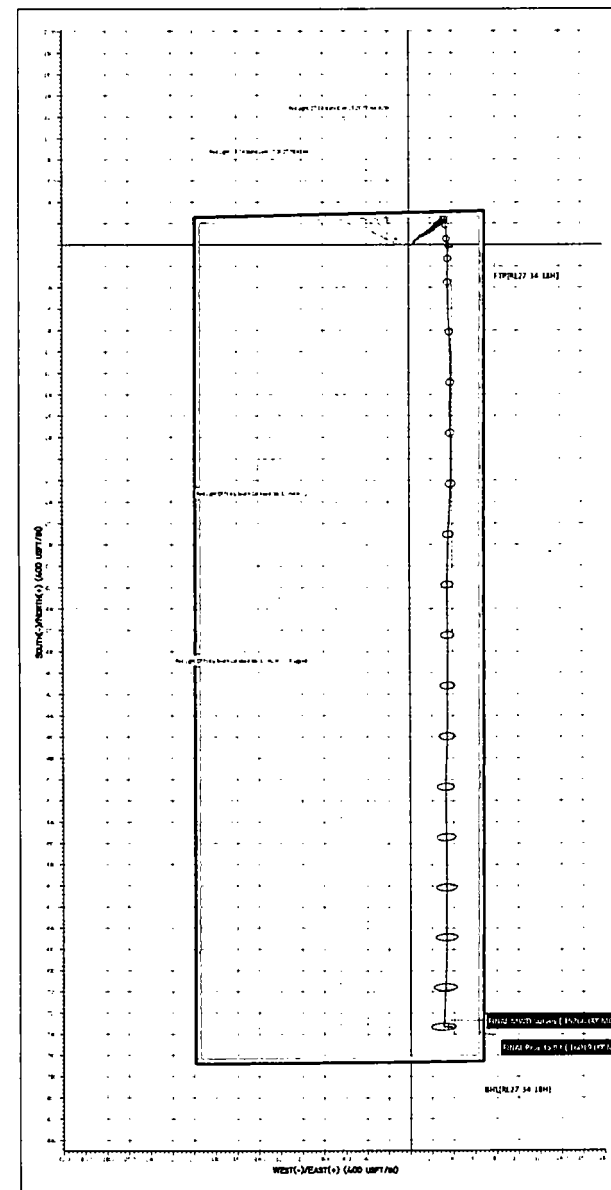
VERTICAL SECTION AT 180.22EASTING (100 USFT/IN)

8HL;AL27-34-18H)

1-800-368-6777



RED LIGHT PAD



Scientific Drilling